



## THE 4<sup>th</sup> INTERNATIONAL SYMPOSIUM ON MINE SAFETY SCIENCE AND ENGINEERING

BEIJING, CHINA

OCTOBER 22-24, 2018



## ISMSSE 2018 Overview

The development and utilization of mineral resources is frequently accompanied by work safety accidents, which leads to heavy casualties and property loss. In the past decade, as mining is going to the deeper earth, coal and rock dynamic hazards and their compound hazards, particularly rock burst and coal and gas outburst, have become even worse. Difficulties in their prevention and control are ever-increasing. Pneumoconiosis in coal mines is severe. Every year, deaths from such disease far surpass those from work safety accidents. This poses a dire threat to the sustainable development of mines. Noticeably, mine safety-related information construction is relatively lagging behind, resulting in a great number of mine hazards and worsened mining environment. Consequently, devastating mine accidents tend to rise.

At such backdrop, a series of international academic conferences, namely, International Symposium on Mines Safety Science and Engineering (ISMSSE), had been held successfully since 2011. Now the symposium has evolved into a grand international gathering that covers mine safety science theory, technology and engineering practice. It is held bi-annually, so far, three symposiums were held in Beijing and Montreal, gaining international recognition. In 2017, Prof. Xueqiu He and Prof. Hani Mitri together initiated International Committee on Mine Safety Science and Engineering (ISMSSE), serving to promote the symposium development and the exchange among international counterparts.

The Fourth International Symposium on Mine Safety Science and Engineering (ISMSSE 2018) is hosted by University of Science and Technology Beijing. The event will focus on such themes as mine safety science theory, mine environment safety, mine dynamic disasters, coal mine gas, mine emergency rescue, mine occupational health, mine safety management and safety behavior, mine safety information technology and mine equipment safety. Four venues will include Mine Safety Science and Emergency Rescue, Mine Dynamic Hazards, Coal Mine Gas and Outburst, and Mine Occupational Health and Environmental Safety. The symposium will arrange 4 plenary lectures, 44 invited presentations and 102 paper presentations. 25 excellent paper awards will be selected, and 100 papers will be recommended to related journals for publication.

The symposium will serve as a bridge for global mine players to exchange mine safety science theory, technology and engineering practice, and enhance the interactions among the government, enterprises and academic circle.





# Partners

## **Host :**

University of Science and Technology Beijing

## **Co-hosts :**

McGill University

China University of Mining and Technology, Beijing

Henan Polytechnic University

Xi'an University of Science and Technology

Heilongjiang University of Science and Technology

North China University of Technology

Northeastern University

Chongqing University

China University of Mining and Technology

Laurentian University

University of Wollongong

Liaoning Technical University

Jiangxi University of Science and Technology

## **Supporters:**

Ministry of Education of the People's Republic of China

National Natural Science Foundation of China

China Occupational Safety and Health Association



# Partners

China Academy of Safety Science and Technology

China Coal Information Institute

Zhong-an Academy of Safety Engineering

*International Journal of Mining Science and Technology*

## **Sponsors:**

Xi'an University of Science and Technology

Heilongjiang University of Science and Technology

North China University of Technology



# Guidelines for Participants



## Conference registration

October 22 (Full day): Hall on the first floor of Xijiao Hotel;

October 23 (8:00-18:00): Hall on the first floor of Xijiao Hotel.



## Conference schedule

Date	Time	Activity contents
2018.10.22	Full Day	Conference registration
2018.10.23	Morning	Opening ceremony and plenary lecture
	Afternoon	Breakout sessions
2018.10.24	Morning	Breakout sessions
	Afternoon	Breakout sessions



## Conference report

The report PPT needs to be copied to the conference computer of the venue 30 minutes before the start of the conference.



## Meals

Buffet, dining at the Shangyuan dining room, meal coupons are required.



## Matters need attention

- ❖ Please arrive at the venue 10 minutes in advance and take seat.
- ❖ Please turn off or mute your phone during the conference to keep the venue quiet.
- ❖ There may be changes in the time, venue and speaker of the conference, whichever is subject to specific arrangements on the day.



## Contact methods

Phone: 86-10-62333366

Email: [ismsse2018@ismsse.com](mailto:ismsse2018@ismsse.com)

Address: University of Science and Technology Beijing, 30 Xueyuan Road, Haidian District, Beijing, China



# Organization

## Honorary Chairs



Shining ZHOU



Tiegang ZHANG



Liang YUAN



Meifeng CAI

## General Chair



Aixiang WU

## Co-chairs

Jun MA, China Occupational Safety and Health Association

Xingkai ZHANG, China Academy of Safety Science and Technology

Youguo HE, China Coal Information Institute

Xiaolin YANG, Henan Polytechnic University

Jiren WANG, Liaoning Technical University

Gang HE, Guizhou Kailin International Trading Co., LTD

Shihe ZHANG, Guizhou Panjiang Coal and Electricity Group Co., LTD

Ningbo WANG, Shenhua-Xinjiang Energy Co., LTD

Fengshan ZHU, China Coal Research Institute

Yunmin WANG, Sinosteel Maanshan Institute of Mining Research

Haizhu LUO, CCTEG Shenyang Research Institute

Liangcai FANG, Huaibei Coal Group Co., LTD.

Xueqiu HE, University of Science and Technology Beijing



# Organization

## Organizing Committee

### Chair



Longzhe JIN

### Co-chairs

Hani MITRI, McGill University (Canada)

Jiachen WANG, China University of Mining and Technology, Beijing

Xiating FENG, Northeastern University

Shugang LI, Xi'an University of Science and Technology

Zuwen LIU, Jiangxi University of Science and Technology

Ming CAI, Laurentian University (Canada)

Deyi JIANG, Chongqing University

Fubao ZHOU, China University of Mining and Technology

Jianping WEI, Henan Polytechnic University

Tingxiang REN, University of Wollongong (Australia)

Qiang WU, Heilongjiang University of Science and Technology

## Technical Program Committee

### Chair



Xueqiu HE

### International Chair



Hani MITRI



# Organization

## Members

Ming CAI, Laurentian University (Canada)  
Euler DESOUZA, Queen's University (Canada)  
Derek APEL, University of Alberta (Canada)  
Miguel F. Tato DIOGO, University of Porto (Portugal)  
H. Sebnem DUZGUN, Colorado School of Mines (United States)  
Longzhe JIN, University of Science and Technology Beijing  
Mehmet KIZIL, University of Queensland (Australia)  
Jun-ichi KODAMA, Hokkaido University (Japan)  
Petr KONICEK, Czech Academy of Sciences (Czech Republic)  
Mustafa KUMRAL, McGill University (Canada)  
Mingju LIU, Henan Polytechnic University  
Rudrajit MITRA, University of Witwatersrand (South Africa)  
Baisheng NIE, China University of Mining and Technology, Beijing  
Stanislaw PRUSEK, Central Mining Institute(Poland)  
  
Vic PAKALNIS, Laurentian Mining Innovation and Technology (Canada)  
Jerry RAN, Kinross Gold Corporation (Canada)  
Tingxiang REN, University of Wollongong (Australia)  
Atsushi SAINOKI, Kumamoto University (Japan)  
Agus Pulung SASMITO, McGill University (Canada)  
Dazhao SONG, University of Science and Technology Beijing  
J.P.K. TSHIBANGU, Université de Mons (Belgium)  
Enyuan WANG, China University of Mining and Technology  
Yunhai WANG, China Academy of Safety Science and Technology  
Jianping WEI, Henan Polytechnic University  
Bin YU, Datong Coal Mine Group  
Guangzhi YIN, Chongqing University  
Zhenfu LUO, China University of Mining and Technology  
Jianqiang CHEN, Shenhua-Xinjiang Energy Co., LTD  
Ziyin ZU, Guizhou Panjiang Refined Coal Co., LTD  
Yunliang TAN, Shandong University of Science and Technology  
Hongqing ZHU, China University of Mining and Technology, Beijing  
Shiguo SUN, North China University of Technology  
Linming DOU, China University of Mining and Technology





# Organization

Cheng WANG, Beijing Institute of Technology

Kai WANG, China University of Mining and Technology, Beijing

Junyan ZHANG, University of Science and Technology Beijing

Nailian HU, University of Science and Technology Beijing

Zhongxue LI, University of Science and Technology Beijing

Weidong SONG, University of Science and Technology Beijing

Cuifeng DU, University of Science and Technology Beijing

Min GONG, University of Science and Technology Beijing

Zhong'an JIANG, University of Science and Technology Beijing

Yinghua ZHANG, University of Science and Technology Beijing

Tie LI, University of Science and Technology Beijing



# Symposium schedule

October 23, 09:00-12:00

Venue: Jinyuan Conference Hall

## SYMPOSIUM OPENING CEREMONY

**Host: Aixiang Wu, Chair of ISMSSE 2018**

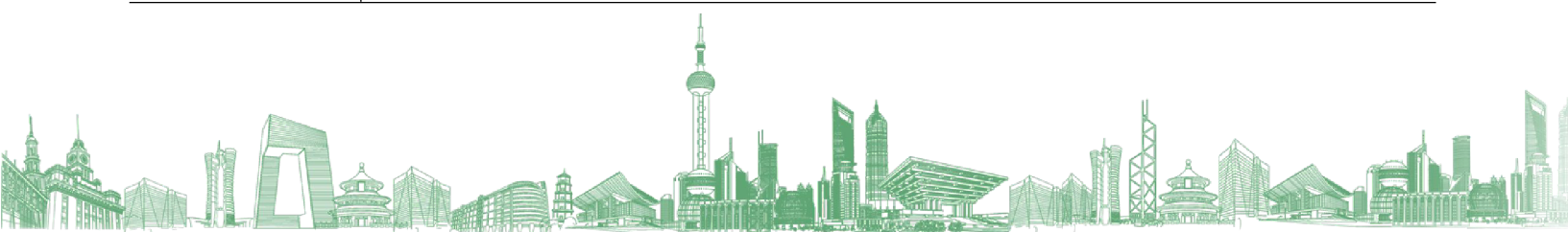
Vice President, University of Science & Technology Beijing

09:00-09:30	<b>Welcome: Prof. Renshu YANG, President</b> University of Science & Technology Beijing
	<b>Address: Hongwei SUN, Director</b> National Natural Science Foundation of China
	<b>Address: Prof. Hani MITRI, TPC International Chair</b> McGill University
	<b>Address: Shining ZHOU, Academician, Honorary</b> Chinese Academy of Engineering
	<b>Address: Tiegang ZHANG, Academician, Honorary</b> Chinese Academy of Engineering
	<b>Address: Prof. Longzhe JIN, Organizing Committee Chair</b> University of Science & Technology Beijing
09:30-09:40	<b>Excellent Paper Announced, Prof. Xueqiu HE, TPC Chair</b> University of Science & Technology Beijing
	<b>Excellent Paper Award</b>
09:40-10:00	<b>Coffee/tea break</b>

## SYMPOSIUM PLENARY SESSION

**Hosts: Prof. Xueqiu HE & Prof. Hani MITRI**

10:00-10:30	<b>Recent advances in coal mine safety of China</b> Liang YUAN, President/Academician, Anhui University of Science & Technology, CHINA
10:30-11:00	<b>Influence the canopy ratio of powered roof support on the longwall working stability - case study</b> Prof. Stanislaw PRUSEK, Central Mining Institute, POLAND
11:00-11:30	<b>Study on inducing mechanism and its prediction-prevention of mining shock bump based on energy analysis</b> Meifeng CAI, Academician, University of Science & Technology Beijing, CHINA
11:30-12:00	<b>Volumetric changes in the focal areas of seismic events corresponding to distress blasting</b> Prof. Petr KONICEK, Institute of Geonics, CZECH REPUBLIC

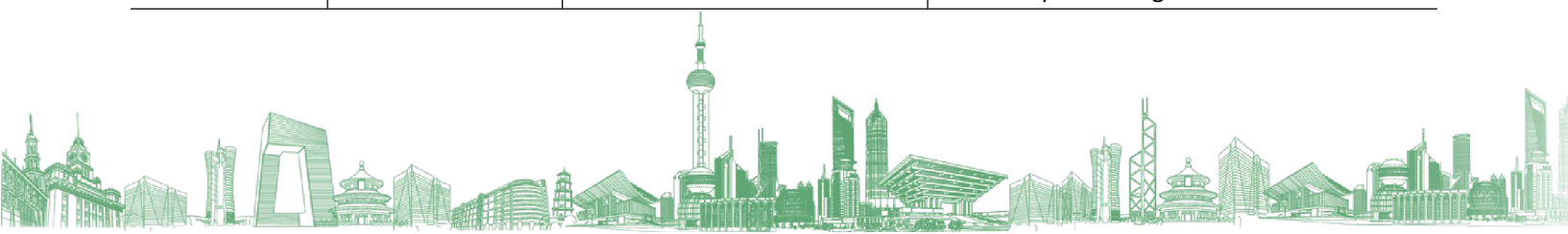


# Symposium schedule

October 23, 13:30-17:20

Venue: 1st meeting room

First Session: Mine Safety Science and Emergency Rescue			
Session Chair: Prof. Gui FU, China University of Mining & Technology, Beijing			
Invited report	Hosts: Prof. Gui FU & Prof. Tomasz JANOSZEK		
13:30-13:50	Mustafa KUMRAL	McGill University	Analysis of latent variables in occupational health and safety in the mining industry
13:50-14:10	Jian SHUAI	China University of Petroleum, Beijing	Pipeline risk assessment and control
14:10-14:30	Tomasz JANOSZEK	Central Mining Institute (GIG)	The influence of longwall gateroad convergence on the ventilation process of mine ventilation network - model tests
14:30-14:50	Zaigang XU	Guizhou Panjiang Coal & Electricity Group Co., LTD.	Exploration of new ways to achieve green coal mining in Guizhou coal mines
14:50-15:05	Coffee/tea break		
Paper report	Hosts: Prof. Mustafa KUMRAL & Prof. Jian SHUAI		
15:05-15:20	Youliang CHEN	China Academy of Safety Science & Technology	Application of data mining in risk control of safety production
15:20-15:35	Dongmei TIAN	North China Institute of Science & Technology	Analysis on the occupation harm of dust based on the hierarchical clustering methods
15:35-15:50	Jiangshi ZHANG	China University of Mining & Technology, Beijing	Characteristics of poor safety culture within coal mine enterprises based on accident statistics
15:50-16:05	Chunrong WEI	Heilongjiang University of Science & Technology	Study on the relationship between job stress, job fatigue and security attitude of construction workers
16:05-16:20	Jian LIU	University of Science & Technology Beijing	An empirical study of early warning model on the number of coal mine accidents in China
16:20-16:35	Wei JIANG	China University of Mining & Technology, Beijing	Study on quantitative measurement result of enterprise safety culture in China
16:35-16:50	Yunhua GONG	China University of Petroleum, Beijing	Oil and gas pipeline risk acceptance criteria
16:50-17:05	Dongjing XU	Shandong University of Science & Technology	A novel conceptual model of fracture evolution patterns causing water leakage
17:05-17:20	Yan DU	University of Science & Technology Beijing	Numerical analysis and field industrial verification test on hydrostatic test platform for waterproof refuge chamber



# Symposium schedule

October 24, 08:30-12:05

Venue: 1st meeting room

## First Session: Mine Safety Science and Emergency Rescue

Session Chair: Prof. Gui FU, China University of Mining & Technology, Beijing

Invited report	Hosts: Prof. Yinghua ZHANG & Prof. Sebnem DUZGUN		
08:30-08:50	Gui FU	China University of Mining & Technology, Beijing	New progress in the accident causation models
08:50-09:10	Garry MARLING	University of Queensland	Accident prevention by system safety techniques
09:10-09:30	Hong XIE	North China Institute of Science & Technology	Research progress on safety system dynamics
09:30-09:50	Ruipeng TONG	China University of Mining & Technology, Beijing	Characteristic analysis of unsafe behavior by coal miners: multi-dimensional description of the pan-scene data
09:50-10:05	Coffee/tea break		
Paper report	Hosts: Prof. Hong XIE & Prof. Garry MARLING		
10:05-10:20	Zhong'an JIANG	University of Science & Technology Beijing	Multi-objective routing in underground emergency evacuation under real time effect of disaster spread
10:20-10:35	Hui ZHANG	Tsinghua University	Comprehensive evaluation of virtual reality mine safety training system
10:35-10:50	Surui XU	China University of Labor Relations	Analysis of special equipment accidents with "2-4" model
10:50-11:05	Ya PENG	University of New South Wales	Hydrogeochemical modelling for corrosive environment enhancing premature failure of anchor bolts in underground coal mines
11:05-11:20	Jianrui FENG	China University of Geosciences	Research on site selection and optimization of mine safety rescue station based on the workload of rescue teams
11:20-11:35	Jie JIANG	Guangxi University	Study on deep leakage mechanism of tailing pond in karst area
11:35-11:50	Hui MA	North China Institute of Science & Technology	Research on low carbon ecological mine construction mode of aging mine
11:50-12:05	Jinxin GAO	University of Science & Technology Beijing	Prediction method study of Chinese coal mine accidents using ARIMA model

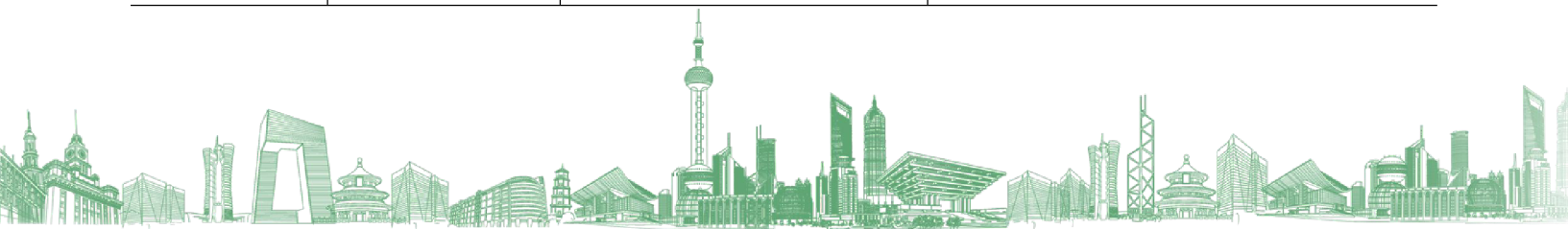


# Symposium schedule

**October 24, 13:30-17:30**

**Venue: 1st meeting room**

First Session: Mine Safety Science and Emergency Rescue			
Session Chair: Prof. Gui FU, China University of Mining & Technology Beijing			
Invited report	Hosts: Prof. Xuexi CHEN & Hua ZHANG		
13:30-13:50	Haiyan SHAO	General Electric Company(GE)	Introduction of advanced safety management concepts and practices of foreign companies
13:50-14:10	Sebnem DUZGUN	Colorado School of Mines	Use of virtual reality in underground roof hazard assessment and risk mitigation
14:10-14:30	Yunxiao FAN	China University of Geosciences, Beijing	Development of tailored safety performance indicators frame-working for the inspection in Chinese enterprises
14:30-14:45	Coffee/tea break		
Paper report	Hosts: Prof. Yunxiao FAN & Haiyan SHAO		
14:45-15:00	Hua ZHANG	Beijing Xindi Security Technology Service Co., LTD.	Barrier thinking of risk management
15:00-15:15	ChuanHai LIU	Heilongjiang Institute of Science & Technology	Raman spetroscopic study on ternary model coal mine methane hydrates
15:15-15:30	Yanyun WANG	Xi'an University of Science & Technology	Miner agent structure based on BDI model
15:30-15:45	Tong ZHU	China University of Mining & Technology, Beijing	Analysis of unsafe acts in the development of derailing accidents of inclined shaft trip lifting in coal mines
15:45-16:00	Wenyue ZHANG	China University of Mining & Technology,Beijing	Unsafe behavior classification at individual level based on accident causal models
16:00-16:15	Huimin GUO	Xi'an University of Science & Technology	Weight determination of mine work safety influencing factors based on factor analysis
16:15-16:30	Hongyu HAO	China University of Mining & Technology, Beijing	Study on common characteristics and demonstration paths of beijing safety culture demonstration enterprises
16:30-16:45	Baoyuan WANG	Xi'an University of Science & Technology	A high-precision personnel positioning system based on wireless pulse technology
16:45-17:00	Daming WU	China Coal Information Institute	Work safety success theory based on dynamic safety entropy model
17:00-17:15	Qun ZHAO	China University of Mining & Technology, Beijing	Study on the relationship between safety management practices and behaviors
17:15-17:30	Xue LI	China University of Mining & Technology, Beijing	APP research based on internet and behavioral safety



# Symposium schedule

October 23, 13:30-17:20

Venue: 6th meeting room

Second Session: Mine Dynamic Hazards			
Session Chair: Prof. Linming DOU, China University of Mining & Technology			
Invited report	Hosts: Prof. Linming DOU & Prof. Jerry RAN		
13:30-13:50	Yishan PAN	Liaoning University	Integrated research on combined dynamic hazards of coal and gas outburst and rock burst
13:50-14:10	Ming CAI	Laurentian University	Rock support in strainburst-prone ground
14:10-14:30	Qingxin Qi	Coal Science and Technology Research Institute Company Limited	Theory and technology of multi-scale source control for coal and rock dynamic hazards in deep mining
14:30-14:50	Joaquim GOIS	University of Porto	Circular statistical models in the studies of the atmospheric dispersion of particles from mining tailings dams
14:50-15:05	Coffee/tea break		
Paper report	Hosts: Prof. Derek APEL & Prof. Yishan PAN		
15:05-15:20	Longqing SHI	Shandong University of Science & Technology	Research on the width of fault waterproof coal pillar based on underground pressure control theory
15:20-15:35	Anye CAO	China University of Mining & Technology	Loading rate effect on rock damage evolution and acoustic emission characteristic under uniaxial compression
15:35-15:50	Hongwei WANG	China University of Mining & Technology, Beijing	Investigation of sudden faults instability induced by coal mining
15:50-16:05	Guangjian LIU	China University of Mining and Technology	Theory and numerical investigations of floor dynamic rupture: a case study in Zhaolou coal mine, China
16:05-16:20	Jian ZHOU	Central South University	Slope stability analysis for circular mode failure: a gradient boosting machine approach
16:20-16:35	Aibing JIN	University of Science & Technology Beijing	Analysis of the deformation and fracture of underground mine roadway by joint rock mass numerical model
16:35-16:50	Lianhe WANG	Key Laboratory of Deep Coal Resource Mining	Numerical simulation on failure effect of mining-induced dynamic loading and its influential factors
16:50-17:05	Xingyue QU	Shandong University of Science & Technology	Prediction of maximal water bursting discharge from coal seam floor based on multiple nonlinear regression analysis
17:05-17:20	Hu HE	China University of Mining & Technology	Directional hydraulic fracturing of thick hard roof for rockburst prevention





# Symposium schedule

**October 24, 08:30-11:50**

**Venue: 6th meeting room**

Second Session: Mine Dynamic Hazards			
Session Chair: Prof. Linming DOU, China University of Mining & Technology			
Invited report	Hosts: Prof. Yunliang TAN & Prof. Ming CAI		
08:30-08:50	Derek APEL	University of Alberta	Machine learning methods for rockburst prediction--state-of-the-art review
08:50-09:10	Linming DOU	China University of Mining & Technology	Coal burst prevention and case analysis
09:10-09:30	Jerry RAN	Kinross Gold Corporation	Cases of safe mining under wide spans in underground non-caving mines
09:30-09:50	Zhenhua OUYANG	North China Institute of Science & Technology	Study on the rock burst tendentiousness of coal under different gas pressures
09:50-10:05	Coffee/tea break		
Paper report	Hosts: Prof. Zonglong MU & Prof. Atsushi SAINOKI		
10:05-10:20	Xiangjun CHEN	State Key Laboratory Cultivation Base for Gas Geology & Gas Control	The current situation and prevention and control countermeasures for typical dynamic disasters in kilometer-deep mines in China
10:20-10:35	Xuwei LI	State Key Laboratory of Coal Resources & Safe Mining	Influence of a width-decreasing coal pillar on the convergence characteristics of a thousand-meter-deep exploration roadway
10:35-10:50	Jinglin WEN	China Academy of Safety Science & Technology	Evaluation method for rockburst risk based on equivalent surrounding rock strength
10:50-11:05	Chao WANG	Kunming University of Science & Technology	Analysis on the classification model of coal's bursting liability based on database with large samples
11:05-11:20	Jian LIU	University of Science & Technology Beijing	Analysis of microseismic monitoring data and early warning model of rock burst in coal mine
11:20-11:35	Xingli ZHANG	Shandong University of Science & Technology	Identification of micro-seismic signals based on VMD and singular spectrum entropy
11:35-11:50	Chunde PIAO	China University of Mining & Technology	Simulation experiment study on fiber monitoring and settlement regulation of overburden deformation caused by backfill mining



# Symposium schedule

October 24, 13:30-17:00

Venue: 6th meeting room

Second Session: Mine Dynamic Hazards			
Session Chair: Prof. Linming DOU, China University of Mining & Technology			
Invited report	Hosts: Prof. Anye CAO & Prof. Joaquim GOIS		
13:30-13:50	Atsushi SAINOKI	Kumamoto University	Determination of a geometrical constant for a circular slip zone
13:50-14:10	Yunliang TAN	Shandong University of Science & Technology	Prevention mechanism and methods of rockburst
14:10-14:30	Peter KNIGHTS	University of Queensland	A study of mining fatalities and coal price variation
14:30-14:45	Coffee/tea break		
Paper report	Hosts: Prof. Hongwei WANG & Prof. Peter KNIGHTS		
14:45-15:00	Xiaofei JING	Chongqing University of Science & Technology	Grain-size effect on the hydro-dynamics of mudflow surging from tailings dam-break
15:00-15:15	Jinhai LIU	North China Institute of Science & Technology	Zoning and gradation management model for rock burst in coal mines
15:15-15:30	Yungang WANG	Henan Polytechnic University	Study on the ultrasonic propagation characteristics of coal samples containing hole defects
15:30-15:45	Quanjie ZHU	North China Institute of Science & Technology	Automated determination and optimization method of microseismic P-phase arrival times in steps
15:45-16:00	Yongfeng LIU	Chongqing University	Stability analysis of goaf based on 3D visualization detection
16:00-16:15	Yuxia LIANG	China Academy of Safe Science & Technology	A case study on the risk assessment of the overhead tailings dam
16:15-16:30	Jing LI	China University of Mining & Technology, Beijing	Effect of bedding direction on transient charge on Datong coal sample surface
16:30-16:45	Lishuai JIANG	Shandong University of Science & Technology	Numerical modelling approach on longwall mining-induced strata behavior by considering the fracture- weakening effect on rock mass
16:45-17:00	Weiyao GUO	Shandong University of Science & Technology	Case studies of rock bursts in tectonic areas with facies change



# Symposium schedule

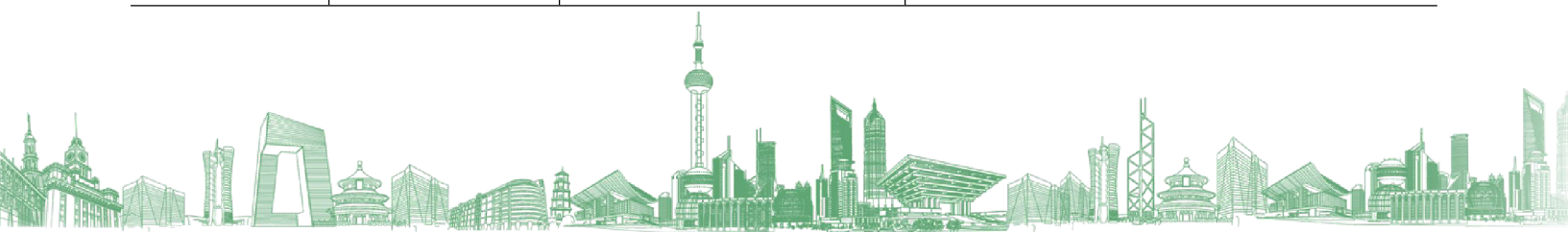
October 23, 13:30-17:05

Venue: 5th meeting room

## Third Session: Coal Mine Gas and Outburst

Session Chair: Prof. Jianping WEI, Henan Polytechnic University

Invited report	Hosts: Prof. Jianping WEI & Prof. Kai WANG		
13:30-13:50	Shugang LI	Xi'an University of Science & Technology	Dynamic evolution of mining fissure elliptic paraboloid zone under different mining height and co-extraction of coal and gas
13:50-14:10	Tingxiang REN	University of Wollongong	Gas drainage in Australian underground coal mines: practices and challenges
14:10-14:30	Yuanping CHENG	China University of Mining & Technology	Coal and gas outburst accident and enlightenment
14:30-14:50	Adam SCHWARTZKOPFF	Kumamoto University	Numerical simulation of an in-situ fluid injection experiment with a coupled X-FEM analysis
14:50-15:05	Coffee/tea break		
Paper report	Hosts: Prof. Tingxiang REN & Prof. Jianguo ZHANG		
15:05-15:20	Biming SHI	Anhui University of Science & Technology	Study on property and effect of cavity structure wave absorbing to gas explosion impacting
15:20-15:35	Zhonghui LI	China University of Mining & Technology	Coal damage evolution and surface stress field based on infrared radiation temperature
15:35-15:50	Gang WANG	Shandong University of Science & Technology	Study on gas seepage of microscopic pore fracture structure of coal based on fractal theory and CT image artificial fracture technology
15:50-16:05	Xiaofei LIU	China University of Mining & Technology	"Strain-AE- ultrasonic" multi physical field testing of coal and rock sample under Staged Loading and damage evolution mechanism
16:05-16:20	Jun HAN	Liaoning Technical University	Control of geological structure and its evolution to coal and gas outburst
16:20-16:35	Yungang WANG	Henan Polytechnic University	Study on the ultrasound attenuation features in loading coal
16:35-16:50	Tao YANG	North China Institute of Science & Technology	Experiment investigation on temperature variation during gas adsorption and desorption on coal surface
16:50-17:05	Nan LI	China University of Mining & Technology	The characteristics of microseismic waveforms induced by hydraulic fracturing of coal seam in underground coal mines



# Symposium schedule

October 24, 08:30-12:05

Venue: 5th meeting room

## Third Session: Coal Mine Gas and Outburst

Session Chair: Prof. Jianping WEI, Henan Polytechnic University

### Invited report

Hosts: Prof. Shugang LI & Prof. Yuanping CHENG

08:30-08:50	Enyuan WANG	China University of Mining & Technology	Fine detection technology of gas outburst area based on direct current method in the Zhuxianzhuang coal mine, China
08:50-09:10	Jianguo ZHANG	China Pingmei Shenma Group	Investigation of self-sealing of upward boreholes using drilling cuttings to enhance coal-bed methane recovery
09:10-09:30	Kai WANG	China University of Mining & Technology, Beijing	Optimizing the borehole directions of coal seam gas drainage by incorporating the permeability anisotropy-induced dominant gas flow pathways
09:30-09:50	Yinghua ZHANG	University of Science & Technology Beijing	Study on the mechanism of the complex micellar system of SDS/Triton X-100 solubilization of methane

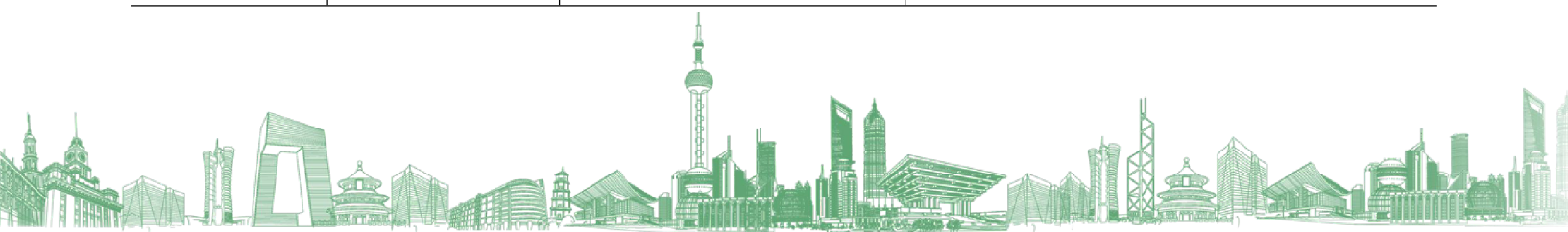
09:50-10:05

Coffee/tea break

### Paper report

Hosts: Prof. Qiang WU & Prof. Zengchao FENG

10:05-10:20	Guozhong HU	China University of Mining & Technology	Gas desorption behavior and microstructure development of coal under microwave irradiation
10:20-10:35	Zhi'an HUANG	University of Science & Technology Beijing	Experimental study on methane dissolved by surfactant—alkane system
10:35-10:50	Xiangchun LI	China University of Mining & Technology, Beijing	Effects of different particle size and adsorption pressure on gas diffusion in coal
10:50-11:05	Gongda WANG	China Coal Research Institute	The impact of bidisperse diffusion on CBM production
11:05-11:20	Peng CHEN	North China Institute of Science & Technology	Experimental study on multi-parameter electrical characteristics of coal containing gas during extrusion process
11:20-11:35	Lei ZHANG	China University of Mining & Technology	Experimental study on gas sorption, gas flow and gas injection displacement characteristics of bituminous coal
11:35-11:50	Jie LIU	Qingdao University of Technology	Experimental research on occurrence laws and mechanism of gas coal extrusion
11:50-12:05	Fei HUANG	Hunan University of Science & Technology	New technique and theory of jet slotting soft coal seam in south China



# Symposium schedule

October 24, 13:30-17:05

Venue: 5th meeting room

## Third Session: Coal Mine Gas and Outburst

Session Chair: Prof. Jianping WEI, Henan Polytechnic University

Invited report	Hosts: Prof. Enyuan WANG & Prof. Jun Han		
13:30-13:50	Yanwei LIU	Henan Polytechnic University	The rapid determinations of soft coal seam gas content based on gas dynamic diffusion theory from coal particle
13:50-14:10	Zengchao FENG	Taiyuan University of Technology	Mechanical characteristics of coal seam in thermal exploitation of coalbed methane
14:10-14:30	Baoyong ZHANG	Heilongjiang Institute of Science & Technology	Coal and gas outburst prevention and coal mine gas separation based on hydrate method
14:30-14:50	Dazhao SONG	University of Science & Technology Beijing	Electrical characteristics of micro-surface of coal with different degrees of metamorphism and their influencing factors
14:50-15:05	Coffee/tea break		
Paper report	Hosts: Prof. Biming SHI & Prof. Zhanyou SA		
15:05-15:20	Ying HAN	Henan Polytechnic University	Numerical simulation of borehole instability and failure types based on fluid-solid coupling dynamic model of coal-containing gas
15:20-15:35	Xiaodong WU	University of Science & Technology Beijing	Numerical simulation and field application of deep hole pre-splitting blasting technologies for gas drainage under different conditions
15:35-15:50	Xiaoguang QIAO	Shenyang Branch of China Coal Research Institute	Cracking mechanism of liquid carbon dioxide fracturing and definition of its influence range
15:50-16:05	Pengxiang ZHAO	Xi'an University of Science & Technology	Study on evolution law of gas migration dominant channel in fully-mechanized coal mining face under the effect of dip angle of different seams
16:05-16:20	Ruihuan LV	Henan Polytechnic University	Development and application of an adsorption-desorption-seepage experimental device for gas saturated coal
16:20-16:35	Dong ZHOU	Taiyuan University of Technology	Methane adsorption characteristics of coal with inhomogeneous potential well
16:35-16:50	Yongjie REN	Henan Polytechnic University	Fracturing effect and temperature transfer of coal under liquid nitrogen cold immersion
16:50-17:05	Xiyu PI	University of Science & Technology Beijing	Gas control application of gas extraction with high level borehole in roof during mining in coal mining face



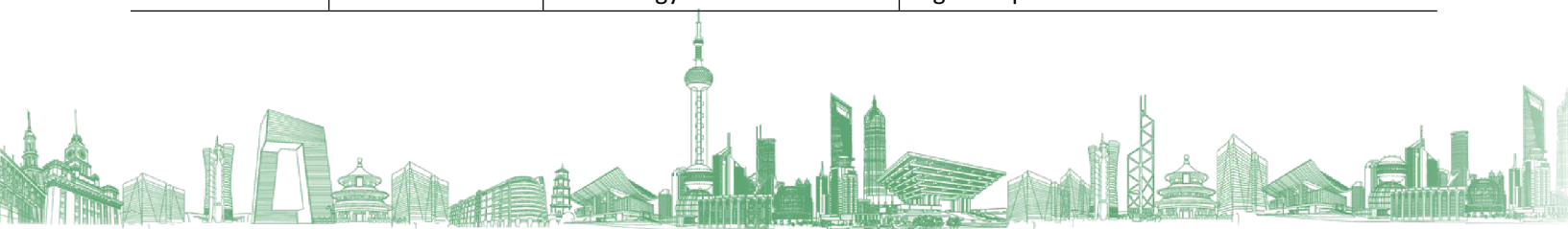


# Symposium schedule

October 23, 13:30-17:00

Venue: 8th & 9th meeting rooms

Fourth Session: Mine Occupational Health and Environmental Safety			
Session Chair: Prof. Jun DENG, Xi'an University of Science & Technology			
Invited report	Hosts: Prof. Jun DENG & Prof. Cheng WANG		
13:30-13:50	Minggao YU	Chongqing University	Key technology and equipment for explosion suppression and loss reduction of gas explosion in coal mines
13:50-14:10	Haiqiao WANG	Hunan University of Science & Technology	Exhaust of ventilating shaft and dust purification technology
14:10-14:30	Khanindra PATHAK	Indian Institute of Technology	Risk profiling for corporate risk management
14:30-14:45	Coffee/tea break		
Paper report	Hosts: Prof. Haiqiao WANG & Prof. Miguel Tato DIOGO		
14:45-15:00	Shuguang JIANG	China University of Mining & Technology	Study on bulk density and gas concentration influence on inhibitive effect of foam metal
15:00-15:15	Jingyu ZHAO	Xi'an University of Science & Technology	Effects of high temperature programmed experimental system for bituminous coal by thermokinetic analysis under four stages
15:15-15:30	Jian ZHANG	Henan Polytechnic University	Investigation of proactive inertisation in longwall goaf of bulianta colliery-a CFD approach
15:30-15:45	Hongwei JIN	Xi'an University of Science & Technology	Study on the shatter proneness and its test method of coal in coal and gas outburst
15:45-16:00	Tingxiang CHU	Henan Polytechnic University	Research on the air leakage mechanism and the suitable gas drainage volume with the upper tunnel gas extraction
16:00-16:15	Shuaishuai GAO	Xi'an University of Science & Technology	Effect of other combustible gases on methane explosion characteristics at constant pressure at high temperature
16:15-16:30	Cui DING	China University of Labor Relations	Simulation and experimental study on the airflow distribution in rectangular section tunnels
16:30-16:45	Shuaijing REN	Xi'an University of Science & Technology	Experimental study on the mechanical properties of coal and rock mass under thermo-mechanical coupling
16:45-17:00	Jiajia SONG	Xi'an University of Science & Technology	Gases and thermal behavior during high-temperature oxidation of weathered coal





# Symposium schedule

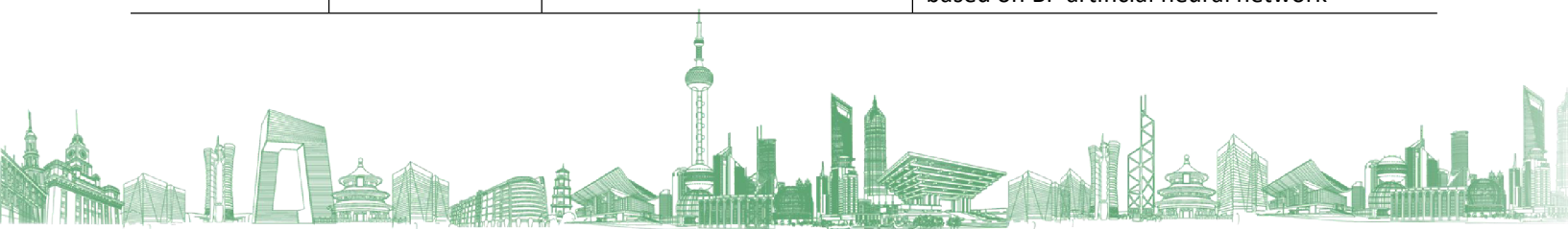
October 24, 08:30-12:00

Venue: 8th & 9th meeting rooms

## Fourth Session: Mine Occupational Health and Environmental Safety

Session Chair: Prof. Jun DENG, Xi'an University of Science & Technology

Invited report	Hosts: Prof. Weiming CHENG & Prof. Khanindra PATHAK		
08:30-08:50	Cheng WANG	Beijing Institute of Technology	Investigation on multiphase explosion mechanism by numerical simulation and experiment
08:50-09:10	Chao LIU	Xi'an University of Science & Technology	Technical research on 3D magnetic imaging of sealing slurry flow track during gas extraction by borehole
09:10-09:30	Haitao MA	China Academy of Safety Science & Technology	Research status analysis for physical model tests of tailings dam
09:30-09:45	Coffee/tea break		
Paper report	Hosts: Prof. Zhenmin LUO & Prof. Gang WANG		
09:45-10:00	Zhong'an JIANG	University of Science & Technology Beijing	Study on dust transport law and effect of dust removal in ore unloading station
10:00-10:15	Xianwei DONG	North China University of Science & Technology	Study on the law of gas production during coal heating oxidation
10:15-10:30	Na GAO	University of Science & Technology Beijing	Research on the impact of mental fuel for oxygen supply performance of sodium chlorate
10:30-10:45	Qiang YANG	Fuzhou University	Characterization of pore structures and adsorption properties for mechanically activated sulfide ores
10:45-11:00	Junqing MENG	China University of Mining & Technology, Beijing	Study on coal wetting mechanism of sodium dodecyl benzene sulfonate concentration by molecular simulation
11:00-11:15	Yukun GAO	University of Science & Technology Beijing	Study on the mechanism of complex micellar system of NaOA /cyclohexane solubilization of methane
11:15-11:30	Bin SU	Xi'an University of Science & Technology	Micro initiation mechanism of multiple flammable gases explosion
11:30-11:45	Qian SHI	Heilongjiang Institute of Science & Technology	Experimental study of obstacle on flame velocity effect of foam metal inhibition on gas explosion
11:45-12:00	Pan ZHANG	Henan Polytechnic University	Research on ventilation system optimization based on BP artificial neural network



# Symposium schedule

October 24, 13:30-16:50

Venue: 8th & 9th meeting rooms

Fourth Session: Mine Occupational Health and Environmental Safety			
Session Chair: Prof. Jun DENG, Xi'an University of Science & Technology			
Invited report	Hosts: Prof. Mingao YU & Prof. Xiaowei ZHAI		
13:30-13:50	Weimin CHENG	Shandong University of Science & Technology	Key technology and equipment for dust pollution control of roadway mechanized tunneling surface
13:50-14:10	Miguel Tato DIOGO	University of Porto	Safety in mining – European directives framework vs.- ISO 45001
14:10-14:30	Zhenmin LUO	Xi'an University of Science and Technology	Explosion characteristics and mechanism of multi-combustible gas in mine fire area
14:30-14:50	Guozhong HUANG	University of Science & Technology Beijing	Study on the vehicle fire: statistic, investigation methods and experimental analysis
14:50-15:05	Coffee/tea break		
Paper report	Hosts: A.Prof. Guozhong HUANG & A.Prof. Xianwei DONG		
15:05-15:20	Fei YIN	China University of Mining & Technology, Beijing	Study on coal surface wettability of different concentration surfactants by molecular simulation
15:20-15:35	Junhong SI	North China Institute of Science & Technology	Parameters optimization of carbon dioxide injection combined with multi-source for fire prevention and extinguishing in goaf
15:35-15:50	Ruhua SUN	China University of Mining & Technology	Study on optimal location of CO monitoring points in coal mine
15:50-16:05	Qiaoyun HAN	Hunan University of Science & Technology	Computational evaluation of cooling system under deep hot and humid coal mine in China: a thermal comfort study
16:05-16:20	Dingli ZHANG	University of Science & Technology Beijing	Risk assessment of lithium battery core short circuit based on fuzzy comprehensive evaluation
16:20-16:35	Litao LIU	Xi'an University of Science and Technology	Temperature influence on peak explosion pressure and flame propagation speed during explosions of flammable gases
16:35-16:50	Xiulei LIU	Beijing Information Science & Technology University	Coal mine safety information relation extraction based on bi-mgu neural networks





北京科技大学  
University of Science and Technology Beijing



## University of Science and Technology

Beijing (USTB) was founded in 1952. Over half a century of remarkable growth, it has developed into one of the most influential key national universities sponsored by the Chinese Ministry of Education. USTB is renowned for its study of metallurgy and materials science. Its main focus is on engineering; at the same time it maintains a

balanced program of science, management, humanities, economics and law. It was one of the first universities to be entitled to establish state-approved graduate schools and was chosen to be part of China's "211 Project", which is designed to develop a hundred first rate universities in the 21st century. In 2006 it was also selected as one of a select group of pilot universities for the "985 Innovation Platform for Advantageous Disciplines". In 2017, it was selected as the "Double-First class" construction university.

USTB has a rigorous teaching faculty. The faculty totals more than 3375, among them over 1760 full-time teachers, 495 professors and 792 associate professors. USTB offers 50 undergraduate programs, 30 first-level discipline master programs, 20 first-level discipline doctoral programs, 16 post-doctoral programs. Four key disciplines, namely, metallurgical engineering, material science and engineering, mining engineering, and history of science and technology, have been ranking on the list of world first-class disciplines in 2017.

USTB values greatly and will cherish its long tradition of being "Rigorous in Learning and Research and Venerating Practice". Over 100,000 graduates are contributing to society all over the world. As metallurgy and materials science are the two disciplines for which it is most renowned, USTB is also known as "the cradle of iron and steel engineers".

USTB has strong collaboration with many different universities around the world. It is now working hard towards its goal of becoming an internationally renowned higher education institute with its own distinguishing features. While retaining its current leading position in metallurgy and materials sciences, it is making great efforts to develop other areas and to achieve a balanced disciplinary structure in engineering and technology, science, management, economics, social sciences, humanities and law in the near future.



# School Introduction

## —— Civil and Resource Engineering School

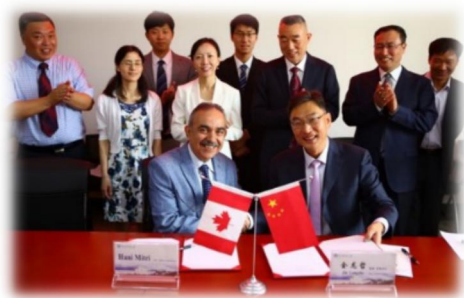


The School of Civil and Resource Engineering of USTB has five departments, including the Department of Safety Science and Engineering, the Department of Resource Engineering, the Department of Civil Engineering, the Department of Mineral Processing Engineering, the Department of Building Environment and Energy Engineering, one experimental center, four research institutes, one key laboratory of the Ministry of Education and one key laboratory of Beijing. It has 2 state first-level key disciplines, 2 state second-level key disciplines. It also has 4 first-level discipline doctoral programs, 11 second-level discipline doctoral programs, 4 master programs, 4 post-doctoral programs.

The School of Civil and Resource Engineering has a rigorous faculty. Among them, there are 1 academicians of the Chinese Academy of Engineering, 2 scholars of the Yangtze River, and 2 recipients of the National Outstanding Youth Science Foundation. The faculty has undertaken more than 300 projects, such as the National Science and Technology Support Program, “973 Program”, “863 Program” and the National Natural Science Foundation. For eight consecutive years, the funding for scientific research reached about 100 million yuan. The school strives to build key disciplines, enhance scientific research and innovation ability, improve the quality of personnel training, and strives to create a distinctive and first-class research institute in China.

# Discipline Introduction

## —— Safety Science and Engineering



Safety science and engineering is one of the early disciplines established in USTB, which has strong collaboration with many different universities around the world. In 2002, it was selected as the key discipline in Beijing (the only key discipline in the field of safety engineering). In 2004, it was approved to construct the "Key Laboratory of Efficient Mining in Metal Mines and Safety Education". In 2007, it was awarded the second-level national key discipline. In 2008, Beijing Education Committee approved the construction of safety engineering specialty (the first batch).

In the recent five years, this discipline has undertaken more than 100 national and provincial-ministerial scientific research projects and more than 300 other scientific research projects, won 3 second-class awards for national scientific and technological progress, 42 provincial-ministerial scientific and technological progress awards, obtained 8 patents for invention, published 25 publications and 1467 academic papers, including 356 SCI and EI papers.





Heilongjiang University of Science & Technology (HUST) is the only university among Heilongjiang, Jilin and Inner Mongolia, with mining as its feature. HUST was co-founded by Heilongjiang Province People's Government and Ministry of Emergency Management of the People's Republic of China. Additionally, it was selected as the only pilot university for the "Emergency Rescue and Impact Control of Coal Mine Accidents" Program serving the special needs of the state for the cultivation of Ph.D.



The genesis of the HUST dates back to 1947, when its predecessor, the first Coal Miners' Cadre School in northern east, was founded in Jixi by Communist Party of China. During 71-year remarkable growth, HUST always sticks to the guidelines of "strive for virtue and knowledge, develop state prosperity" and follows the overall developing principle of "unremitting self-improvement and innovation and entrepreneurship development". Over 100,000 graduates are contributing to society all over the world. Currently HUST has 21939



students. Among them, there are 803 postgraduates. With emphasis on interdisciplinary fusion, HUST has initialized the founding of "five major service platforms". One of the platforms, named National Central Laboratory of Pipeline Safety for Hydrocarbon Gas Transportation, initiated the coal and gas outburst prevention and gas solidification and storage at home and abroad, playing its role in

serving for national safety production.

At present, HUST is concentrating on its goal for becoming the first-class applied university with mining as its feature to make new and greater contributions to the national economic development, the modernization of new Heilongjiang and the development of the industry.



# 西安科技大学

XI'AN UNIVERSITY OF SCIENCE AND TECHNOLOGY



Xi'an University of Science and Technology (XUST) was founded in 1958. It is one of the prominent universities in providing outstanding college graduates, and in conducting cutting-edge research in the coal mining and work safety in the west of China. The university is jointly established by State Administration of Work Safety Supervision and

Shanxi Provincial Government, and is a key high-level university sponsored by Shanxi Province. The XUST provides a series of programs at the provincial level, including 7 doctoral programs, 25 master programs, and 57 bachelor programs, among which work safety program was rated as top program in the forth-round assessment of National University Programs. XUST is characterized by its programs in geology, mining and work safety, and has evolved into a university with not only engineering programs, but arts, science, management and law programs. Presently, XUST has more than 23 thousand students and 2,200 faculty and research staff.

Nearly sixty years of development has witnessed several generations of XUST students making important contributions to China's coal industry and regional economic and social development through pioneering, personnel training and arduous scientific research which always kept a close connection with the local community.

XUST has now expanded into a comprehensive yet continually developing, multi-disciplinary education and research university with mining and its related disciplines as its main traits, covering five main disciplines: Engineering, Science, Management, Literature, and Law. It has nurtured more than 60,000 graduates and they are now playing very important roles in all areas of society.



Looking to the future, XUST, its teachers and students will be adhering to its proud slogans, "Unity, Diligence, Truth-seeking, Innovation", making a constant commitment to develop, innovate and improving XUST into an even stronger teaching and research university with distinctive characteristics by tightly adhering to its "1025" development goals.





北方工业大学  
NORTH CHINA UNIVERSITY OF TECHNOLOGY



North China University of Technology (NCUT) was founded in 1946. It is a municipal university located in the western part of Beijing. The university is co-established by the Beijing Municipal Government and the central government, and is mainly administrated by the local government. NCUT has developed into a multidisciplinary university with 12 schools,

featuring engineering while compatible both in art and science. NCUT offers 47 bachelor degree programs, 20 master degree programs, and 1 PhD program. Currently, NCUT has over 11,000 undergraduate students, 2,600 graduate students, 880 international students, and 3,000 continuing-education students, as well as more than 1000 faculties and staffs.

Centered on enhancing students' self-innovation ability for scientific research, the university voluntarily serves the needs of national and social development, and attaches importance to scientific innovation, which has achieved remarkable results in high-tech development, application research, industrialization production, and gained advantages in some fields. In recent years, NCUT has won more than 700 founding projects, including 151 National Natural Scientific Research Foundations (NSFC) and 23 National Social Science Funds of China (SSFC). Additionally, the university also has won 6 second prizes in National Scientific and Technological Progress, 1 Lu Xun Literary Award, and over 50 provincial-level awards.

NCUT focuses on talent cultivation and education quality improvement, and forms the education characteristic of individualized teaching, quality-oriented, and all-round development. As a member of "A plan for Educating and Training Outstanding Engineers of Ministry of Education, NCUT has 21 various engineering research centers, labs, teaching and research centers, etc., including 1 state-level research and teaching demonstration center, 5 municipal-level experimental teaching demonstration centers of Beijing, and 7 provincial-level key labs and engineering research centers. In recent 5 years, students have obtained excellent results in various important competitions.





# ICMSSE

International Committee of Mine Safety Science and Engineering

By Prof. Xueqiu He & Prof. Hani Mitri

In 2011, Prof. Xueqiu He and Prof. Hani Mitri together initiated the first “International Symposium on Mine Safety Science and Engineering (ISMSE)” in Beijing, China. The second and the third symposiums were successfully held in Beijing, China, 2013 and Montreal, Canada, 2016, respectively. The symposium will be held in Beijing, China, in 2018.

This symposium, which is one of the few international academic conferences that focus on the field of mine safety science and engineering, has been proved to be an important communication platform for scholars in mine safety and all participators in related fields worldwide. Specifically, it provides chances for the exchange of mine safety theories and technologies, which promote the upgrading of mine safety technology. It also enhance the interactions among the government, the enterprises, and the academia, and receive wide acclaim and great support from mine safety scholars and enterprise representatives.

On the basis of the previous three successful international symposiums, we proposed to set up the “International Committee of Mine Safety Science and Engineering” in April 2017, and establish a permanent exchange platform for mine safety science and engineering.

The committee was formed in 2017 with the support of all the members, secretary, international secretary and communication assistant.

Website: <http://www.icmsse.com>

## **Organization of ICM SSE:**

**Chair of the committee:** Prof. Xueqiu HE

**International chair of the committee:** Prof. Hani MITRI

**Committee members:**

Agus Pulung SASMITO	McGill University, CANADA
Atsushi SAINOKI	Kumamoto University, JAPAN
Baisheng NIE	China University of Mining and Technology, Beijing, CHINA
Dazhao SONG	University of Science and Technology Beijing, CHINA
Derek APEL	University of Alberta, CANADA
Enyuan WANG	China University of Mining and Technology, CHINA
Euler DESOUZA	Queen's University, CANADA
Guangzhi YIN	Chongqing University, CHINA
H. Sebnem DUZGUN	Colorado School of Mines, UNITED STATES
Hani MITRI	McGill University, CANADA
J.P. K. TSHIBANGU	Université de Mons, BELGIUM
Jerry RAN	Kinross Gold Corporation, CANADA
Jianping WEI	Henan Polytechnic University, CHINA
Jiren WANG	Liaoning Technical University, CHINA
Jun-ichi KODAMA	Hokkaido University, JAPAN
Longzhe JIN	University of Science and Technology Beijing, CHINA
Mehmet KIZIL	University of Queensland, AUSTRALIA
Miguel F.Tato DIOGO	University of Porto, PORTUGAL
Ming CAI	Laurentian University, CANADA
Mingju LIU	Henan Polytechnic University, CHINA
Mustafa KUMRAL	McGill University, CANADA
Petr KONICEK	Czech Academy of Sciences, CZECH REPUBLIC
Rudrajit MITRA	University of Witwatersrand, SOUTH AFRICA
Stanislaw PRUSEK	Central Mining Institute, POLAND
Tingxiang REN	University of Wollongong, AUSTRALIA
Vic PAKALNIS	Laurentian Mining Innovation and Technology, CANADA
Xueqiu HE	University of Science and Technology Beijing, CHINA
Zyle Dirk VAN	University of British Columbia, CANADA

**Committee secretariat:** Secretary, A.P Dazhao SONG

**International secretary:** A.P Mustafa KUMRAL

**Communication assistant:** Bella STARNINO