



# Green Mining Conference 2023:

## The 7<sup>th</sup> International Symposium on Dynamic Hazards in Underground Mines

27~29<sup>th</sup> September 2023  
University of Wollongong, NSW, Australia



# Conference Program



<http://smartmine.com.au/>



## ORGANISERS

University of Wollongong (UOW), Australia  
China University of Mining and Technology (CUMT), China  
AGH University of Science and Technology (AGH), Poland

## CO-ORGANISERS

University of Science and Technology Beijing (USTB), China  
University of New South Wales (UNSW), Australia  
Chongqing University (CQU), China  
Henan Polytechnic University (HPU), China  
Anhui University of Science and Technology (AUST), China  
Liaoning Technical University (LNTU), China  
University of Adelaide (AU), Australia

## ORGANISING COMMITTEE

Chair	Professor Ting Ren, UOW
Co-chairs	Professor Linming Dou, CUMT Professor Piotr Malkowski, AGH
Local Organising Committee	Professor Ting Ren, UOW, Australia D/Professor Zhengyi Jiang, UOW, Australia Professor Alex Remennikov, UOW, Australia Professor Ismet Canbulat, UNSW, Australia Dr Guangyao Si, UNSW, Australia Professor Murat Karakus, UA, Australia Professor Peter Knights, UQ, Australia Professor Vishnu Pareek, CU, Australia A/Professor Ernest Baafi, UOW, Australia Dr Jan Nemcik, UOW, Australia Dr Jon Roberts, UOW, Australia Dr Qingdong Qu, CSIRO, Australia Mrs Justine Calleja, UOW Dr Xiaohan Yang, UQ, Australia Dr Ming Qiao, UOW, Australia Dr Dennis Black, South32, Australia Mr Sharif Burra, Yancoal, Australia
International Organising Committee	Professor Linming Dou, CUMT, China Professor Piotr Malkowski, AGH, Poland Professor Xueqiu He, USTB, China Professor Enyuan Wang, CUMT, China Professor Jialin Xu, CUMT, China Professor Jianping Wei, HPU, China Professor Jun Han, LNTU, China



Professor Sheng Xue, AUST, China  
Professor Yiyu Lu, CQU, China  
Professor Jürgen F. Brune, CSM, USA  
Professor Shimin Liu, PSU, USA  
Professor Anye Cao, CUMT, China  
Professor Zonglong Mu, CUMT, China  
Professor Lei Zhang, CUMT, China  
Dr Radovan Kukutsch, CAS, Czech Republic

Symposium  
Coordinator

Dr Ming Qiao, UOW, Australia  
Dr Changbin Wang, CUMT, China

Event Support

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Helen Jiang, UOW, Australia

Conference Web  
Designer

Dr Dalin Cai, UOW, Australia



## Day 1      Wednesday, 27<sup>th</sup> September 2023

*Building 67 Foyer, Wollongong Campus, UOW*

17:00-19:00

Welcome Reception and Conference Registration

## Day 2      Thursday, 28<sup>th</sup> September 2023

*Building 67 Foyer, Wollongong Campus, UOW*

7:30-8:30 Conference Registration

*Room 104, Building 67, Wollongong Campus, UOW*

8:30-9:00 Conference Opening

**Acknowledgement of Country**

**Opening address**

- UOW executive
- Professor Shirong Ge, CAE academician and President of China University of Mining and Technology Beijing

9:00-10:40 Plenary Session 1: Keynote Presentations

**Session Chair: Professor Ting Ren**

**Narrabri Coal Operations: Opportunities and Challenges**

Mr Gerald Linde, General Manager – Narrabri Coal Operations

**The Role of Ground Support in Burst Control**

Professor Ismet Canbulat, University of New South Wales

**Disaster Source and its Identification of Rockbursts in Underground Coal Mines**

Professor Linming Dou, China University of Mining and Technology

**Burst Management and Research in Australia**

Mr Sharif Burra, General Manager Safety, and Frank Fulham, Chief Development Officer, Yancoal Australia Ltd

10:40-11:10 Group Picture / Morning Tea and Coffee Break

Morning Tea/Coffee Break - Room 102, Building 67, UOW

11:10-12:50 Plenary Session 2: Keynote Presentations

**Session Chair: Professor Ismet Canbulat**

**Coal Burst: What Roles Do the Geological Structures Play**

Dr Baotang Shen, CSIRO



**Snap-Back Behaviour and Associated Excess Strain Energy Calculations for Rock Burst**  
Professor Murat Karakus, The University of Adelaide

**Decoupling Experiments for CH<sub>4</sub> “Diffusion-seepage” in Coal Columns to Effectively Measure Sorption Time**

Professor Yuanping Cheng and Professor Qingquan Liu, China University of Mining and Technology

**Soft Rock, Greater Bed Thickness, Faults and Strong Rockbursts - A Case Study**

Professor Piotr Malkowski, AGH University of Science and Technology

**12:50-13:50**

**Lunch Break - Room 102, Building 67, UOW**

**13:50-15:15 Plenary Session 3**

**Session Chair: Professor Murat Karakus**

**Keynote: Coalmine Safety Management and Supervision Based on Monitoring Big Data**

Professor Enyuan Wang, China University of Mining and Technology

**Negative Pressure Distribution in Branch Long Borehole and its Influence on Gas Drainage Effect**

Professor Jun Liu, Henan Polytechnic University

**Coal Rupture and Rockburst Mechanism in the Localised Dangerous Area**

Associate Professor Minghe Ju, China University of Mining and Technology

**Minimising Coal Mining’s Impact on Biodiversity: Artificial Soils for Post-Mining Land Reclamation at the example of Poland and Slovenia**

Dr Alicja Krzemiń, GIG National Research Institute

**15:15-15:45**

**Afternoon Tea/Coffee Break - Room 102, Building 67, UOW**

**15:45-17:10 Plenary Session 4**

**Session Chair: Dr Guangyao Si**

**Keynote: Coal Permeability Enhancement Method and Gas Flow Characteristics Study**

Professor Lei Zhang, China University of Mining and Technology

**Experimental Study on the Working Performance of Energy-absorbing Structure with High Resistance and Large Deformation**

Associate Professor Xuwei Li, China University of Mining and Technology

**Numerical Analysis of the Effect of Ventilation Door on the Propagation Characteristics of Gas Explosion Shock Waves**

Associate Professor Xuebo Zhang, Henan Polytechnic University



**Effects of Sandstone Aquifer on Dynamic Hazards in a Deep Coal Seam**  
Dr Xiaohan Yang, University of Queensland

17:10-17:20

Day-two Symposium wrap-up

18:30-20:30: Conference Dinner

City Beach Function Centre, 1 Marine Dr, Wollongong NSW 2500  
Industry Guest Speaker: Mr Peter Baker, Vice President, South32 IMC

## Day 3      Friday, 29<sup>th</sup> September 2023

*Room 104, Building 67, Wollongong Campus, UOW*

8:30-10:10 Plenary Session 1: Keynote Presentations

Session Chair: Dr Jan Nemcik

**Outburst Thresholds – Considerations for Wongawilli Seam Mining**  
Dr Dennis Black, Manager Technical Services, Dendrobium Mine South32 IMC

**Understanding the Mechanism of Strong Mining Tremors near the Goaf Area of Longwall Mining: A Case Study**  
Professor Anye Cao, China University of Mining and Technology

**Gas Drainage and Outburst Management at Tahmoor Colliery**  
Mr Malcolm Waterfall, Mining Engineering Manager, Mr Alex Whiticker, SIMEC Mining

**Coal Burst Research Progress and Challenges in China**  
Professor Wu Cai, China University of Mining and Technology

10:10-10:40

Morning Tea/Coffee Break - Room 102, Building 67, UOW

10:40-12:20 Plenary Session 2: Keynote Presentations

Session Chair: Dr Dennis Black

**Coal Bumps and Potential Mitigation Strategies at Narrabri Coal Operations**  
Mr Martin Mackinnon, Whitehaven Coal Limited

**The Development of Explosion Risk Exclusion Zones Around Coal Mine Openings in Emergency Situations**  
Professor Alex Remennikov, University of Wollongong

**Blasting Induced Stress Wave and its Implication on the Pillar Failure for Stone Mines**  
Professor Shimin Liu, Pennsylvania State University

**Numerical Simulation of Curvilinear Cleavage Phenomenon Associated with Gas Outburst**  
Dr Qingdong Qu, CSIRO



12:20-13:20

Lunch Break - Room 102, Building 67, UOW

13:20-14:45 Parallel Session 3A: Room 104- Building 67

**Session Chair: Dr Qingdong Qu**

**Keynote: Experimental Investigation on Coal Pore-fracture Change Characteristics Affected by Solvents**

Professor Chunshan Zheng, Anhui University of Science and Technology

**High-precision Phase Picking and Automatic Source Locating Method for Seismicity in Mines Based on Deep Transfer Learning**

Dr Changbin Wang, China University of Mining and Technology

**Numerical Calculation Study on the Matching of Surrounding Rock Strength and Anchorage Length in Underground Engineering**

Dr Xiaohu Liu, Anhui University of Science and Technology

**Research and Development of Thin Spray-on Liners and Experimental Study on the Performance of Thin Spray Support**

Dr Han Liang, Liaoning Technical University

**True-triaxial Experimental Investigation of Borehole Breakout Formation under In-situ Stress Path**

Mr Zizhuo Xiang, University of New South Wales

13:20-14:45 Parallel Session 3B: Room 107 - Building 67

**Session Chair: Dr Jon Roberts**

**Keynote: Micro Gas Chromatograph Capabilities and Ethylene Detection in the Queensland Coal Mining Industry**

Mr Sean Muller, Principal Scientist, Simtars

**Coal Pore Network Structure Characterisation based on Gas Occurrence and Migration in Coal**

Dr Kaizhong Zhang, China University of Mining and Technology

**Mechanism of Reducing Coal Bursting Risk Using Liquid Nitrogen Cyclic Treatment**

Mr Shuai Chen, China University of Mining and Technology

**Experimental Studies on Correlations between Electrical Resistivity and Permeability in Gas-bearing Coal under Stress**

Mr Yaoyu Shi, China University of Mining and Technology Beijing

**Hydraulic Fracturing in Hard Rock Mines: A Post Campaign Parametric Investigation Using Field Data**

Mr Benjamin James Powlay, The University of Adelaide



14:45-15:10

Afternoon Tea/Coffee Break - Room 102, Building 67, UOW

15:10-16:35 Parallel Session 4A: Room 104- Building 67

**Session Chair: Dr Xiaohan Yang**

**Keynote: Changes in Selected Seismological Parameters during Coal Seam Longwall Mining Interrupted by a Rock Burst**

Dr Łukasz Wojtecki, GIG National Research Institute

**Hazards-causing Mechanism of Water-Sand Mixture Outburst in Coal Mine Shaft**

Dr Mingjing Li, Anhui University of Science and Technology

**Gas Content Estimations Using Geophysical Log - A Case Study in Australian Coal Mines**

Mr Zexin Yu, University of New South Wales

**Gas Drainage Optimisation in High Gassy and Outburst Intelligent Working Face Driven by Safe and High-efficient Mining**

Professor Liang Wang and Mr Shengguang Fu, China University of Mining and Technology

**Moment Tensor Inversion on Multi Dominant Frequency Waveforms Induced by Lab Hydraulic Fracturing on Granite**

Mr Xin Zhang, University of New South Wales

15:10-16:35 Parallel Session 4B: Room 107- Building 67

**Session Chair: Mrs Justine Calleja/Dr Ming Qiao**

**Keynote: Virtual Reality based Simulation and Training Tool for Dust Control in Gateroad Development Panels**

Dr Jon Roberts, University of Wollongong

**Numerical Simulation Study on Dynamic Wetting of Coal Dust by Spray Droplets**

Mr Changwei Xu, Shandong University of Science and Technology

**Research on Dust Pollution Law of Large Mining Height Fully Mechanized Face and Development of Efficient Dust Control Technology**

Mr Lidian Guo, Shandong University of Science and Technology

**Study on the Accumulation of Hydrophilic Groups of Surfactants in Multiphase Solution and the Mechanism of Molecular Dynamic Wetting of Coal**

Mr Qifan Tian, Shandong University of Science and Technology

**Correlation of Toughness Index and Compressive Strength of Coal for Outburst Risk Assessment**

Mr Itmam Abedin, University of Wollongong

16:35-16:50 Conference Close

Room 104- Building 67



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# Wollongong Campus Map



Destination	Building	Ref	Destination	Building	Ref	Destination	Building	Ref
<b>Common Teaching Areas (CTA)</b>			School of Mechanical, Materials, Mechatronics, Biomedical (MMMB)	1	TLL	University Hall	11	T2J
Common Teaching Building	24	10C	School of Mechanical, Materials, Mechatronics, Biomedical (MMMB)	8	TOL	<b>UOW Administration</b>		
Common Teaching Space	38	8E	School of Physics (Phys)	4	TIK	Administration	36	SH
Common Teaching Space	67	8G	School of Physics (Phys)	15	9D	Advancement	398	10M
Common Teaching Space	48	10M	SMART Infrastructure Facility	6	9L	Distribution Centre	318	7D
Common Teaching Space	51	10M	<b>Faculty of Law, Humanities and the Arts</b>			Facilities Management Division	31	7E
Common Teaching Space	55	10M	School of Humanities & Social Inquiry (HSI)	19	10C	Information Management and Technology Systems	398	10M
Common Teaching Space	52	8F	School of Law	67	8C	International Services	398	10M
Common Teaching Space	53	9E	School of Liberal Arts (SOLA)	19	10C	Muslim Prayer Space	50	6J
Hope Theatre	40	10F	School of The Arts, English & Media (TAEM) Pavilion	25A	7G	Security	72	12E
IT'S Student, Lobby	17	1I	School of The Arts, English & Media (TAEM)	29	8D	Strategic Marketing & Communication	398	10M
Lecture Theatre and Communications Centre	20	9H	School of The Arts, English & Media (TAEM)	25	7F	Strategic Planning	398	10M
Lecture Theatre	14	10J	<b>Faculty of Science, Medicine and Health</b>			<b>UOW College</b>		
Early Start Facility and Discovery Centre	21	8F	Ecological Research Centre (ERC)	70	9A	UOW College	30	9E
<b>Faculty of Business</b>			Ecological Research Centre (ERC)	71	9A	UOW College	38	8E
School of Accounting, Economics & Finance (SAEF)	40	10F	Mo eclar Horizons	42	8K	UOW College	39A	10M
School of Management, Operations & Marketing (SMOM)	40	10F	School of Chemistry & Molecular Bioscience (SCMB)	18	10I	<b>UOW Global Enterprises</b>	398	10M
Sydney Business School (SBS)	40	10F	School of Earth, Atmospheric & Life Sciences (SEALS)	15	10J	<b>UOW Pulse</b>		
<b>Faculty of Engineering and Information Sciences</b>			School of Earth, Atmospheric & Life Sciences (SEALS)	35	9J	Food, Retail, Banking, Campus Clinic, Post Office	11	T2J
ES Laboratories	39A	10M	School of Earth, Atmospheric & Life Sciences (SEALS)	43	9K	Food and Retail (Convenience)	67	8G
School of Civil, Mining, Environmental Engineering (CME)	4	11K	School of Medicine - Graduate Medicine	28	7H	Kit's Uni (Child Care)	10	11M
School of Computer Information Technology (SCIT)	3	9M	School of Nursing	41	8J	Sports Hub (UOW Pulse)	9	6I
School of Electrical, Computers, Telecommunications Engineering (SCECTE)	35	9J	Science Teaching Facility	43	9K	Supermarket	11	T2J
School of Mathematics and Applied Statistics (SMAS)	39C	11M	<b>Faculty of Social Sciences</b>			UniActive (Gym & Pool)	13	7J
School of Mechanical, Materials, Mechatronics, Biomedical (MMMB)	2	10L	School of Education	21	8E	UniBar	12	11J
			School of Education	67	8C	UniLife	11	T2J
						Woollyungh Indigenous Centre	30	9E



# Wollongong City Transport

## Wollongong - 55A / 55C Free Shuttle Bus



### Key

- Free Shuttle Bus stops
  - ★ Places of interest
  - T Train station
  - X Stop name reference
  - Weekend service only
- See individual mode network maps for destinations served

### Free shuttle

#### Service times and frequency

**Monday to Friday**  
07:00 to 18:00  
services every 10 minutes  
18:00 to 22:00  
services every 20 minutes

**Saturday, Sunday and Public Holidays**  
08:00 to 18:00  
services every 20 minutes

### Stop names

- 1 University of Wollongong
- 2 TAFE
- 3 Wollongong & Keira High Schools
- 4 Princes Hwy, Fairy Meadow
- 5 Princes Hwy, Elliotts Rd
- 6 Cnr Elliotts Rd & Squires Way
- 7 University of Wollongong Innovation Campus
- 8 Bourke St
- 9 Gipps St, Georges Pl
- 10 Wollongong Harbour
- 11 Corrimal St, Smith St
- 12 WIN Entertainment Centre WIN Stadium
- 13 Burelli St
- 14 Keira St, Crown St
- 15 Wollongong Station
- 16 Wollongong Hospital
- 17 Greenacre Rd, Blich St
- 18 Foley St
- 19 North Wollongong Station



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