

ISMSSE 2021

Symposium Programme

Katowice, Poland
21st - 25th November 2021

The Fifth International Symposium on Mine Safety Science and Engineering (ISMSSE2021) is the premier forum to reach mining safety and health professionals and researchers within the international mining community. The Symposium rich programme with a focus of insightful plenary and breakout -sessions is the backbone of this ISMSSE. This is the first hybrid form of Symposium organization, in which we will meet in the interactive dialogue formats, combining digital and physical interactions at many international locations.



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SYMPOSIUM PROGRAMME

KEYNOTE SPEAKERS

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|  | <p>Professor Xueqiu HE University of Science and Technology Beijing (China) <i>Welcome Keynote</i></p> |
|  | <p>Professor Hani Mitri McGill University (Canada) <i>Keynote lecture: Underground mining without explosives – a mine safety paradigm shift</i></p> |
|  | <p>Professor Petr Konicek Institute of Geonics, Czech Academy of Sciences (Czech Republic) <i>Keynote lecture: Long term experience with distress blasting in coal mining as a rockburst mitigation technique</i></p> |
|  | <p>Professor Rudrajit Mitra RWTH Aachen University (Germany) <i>Keynote lecture: Rock Engineering – Past to Present to Future</i></p> |
|  | <p>Professor Ting Ren University of Wollongong (Australia) <i>Keynote lecture: Proactive Longwall Goaf Inertisation - Are We There Yet?</i></p> |
|  | <p>Professor Raymond J. Durrheim School of Geosciences University of the Witwatersrand, Johannesburg (South Africa) <i>Keynote lecture: The Response of the South African Mining Sector to the Covid-19 Pandemic</i></p> |
|  | <p>Professor H. Şebnem Düzgün Mining Engineering Department, Colorado School of Mines (USA) <i>Keynote lecture: Big Data and AI for the Safety of the Future Mine Environment</i></p> |

SYMPOSIUM PROGRAMME

BREAKOUT -SESSIONS

| Monday, November 22 nd | | |
|-----------------------------------|--|---|
| 8:30-9:15 | WELCOME CEREMONY Prof. Stanisław Prusek Prof. Xueqiu HE | |
| 9:15-9:35 | Keynote speech by Prof. Hani Mitri | |
| BREAK | | |
| Room 1 | SEISMIC HAZARDS IN MINING Chairman: prof. Józef Dubiński | |
| 9:45-10:00 | Atsushi Sainoki | Methodology to simulate triggered and induced seismic activities on a fault plane |
| 10:00-10:15 | Zarina Mukhamedyarova, Fidelis Suorineni | Impact of mining induced continuous rockmass degradation on seismic wave velocity |
| 10:15-10:30 | Marcin Szumny Krzysztof Fuławka Piotr Mertuszka | Blasts aimed at roof protection in development of structures in Lubin mine – case study |
| 10:30-10:45 | Shengquan He Xueqiu He Dazhao SONG Hani Mitri Zhenlei Li Tuo Chen | "Silent period" precursor characteristics of AE-EMR signals before coal and rock failure |
| 10:45-11:00 | Józef Dubiński Krystyna Stec Jacek Krupanek | Comprehensive Use of Gutenberg-Richter Distribution and Geotomography Results to Improve Seismic Hazard Assessment in Hard Coal Mines |
| 11:00-11:15 | Adam Lurka Grzegorz Mutke | Seismic Monitoring and Seismic Data Clustering of mine safety pillar within EPOS PL+ project |
| 11:15-11:30 | Łukasz Mazurkiewicz | Experimental and numerical studies of shock-induced fracture and fragmentation of rocks |

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| | Paweł Baranowski Michał Kucewicz Jerzy Małachowski Krzysztof Damaziak | |
| 11:30-11:45 | Sławomir Siwek | Relationship of variations in gravitational load of the rock mass with induced seismicity in the Upper Silesian Coal Basin, Poland. |
| 11:45-12:00 | Kelly Habib Isaac Vennes Hani Mitri | Hard Rock Breakage with Soundless Chemical Demolition Agents |
| 12:00-12:15 | Yizhuo Li Hani Mitri | Determination of mining-induced stresses using diametral rock core deformation |
| 12:15-12:30 | Ruofan Wang Li Li | Time-dependent stability of side-exposed backfill associated with the creep of rock walls |
| 12:30-12:45 | Isaac Vennes Hani Mitri | Optimization of large-scale panel destressing for remnant pillar extraction |
| 12:45-13:00 | Heba Khalil Tuo Chen Yu-Hang Xu Hani Mitri | Effect of mining, and geology on mining-induced seismicity – A case study |
| LUNCH | | |
| 14:15-14:35 | Keynote speech by Prof. Petr Konicek | |
| 14:35-14:55 | Keynote speech by Prof. Rudrajit Mitra | |
| 14:55-15:00 | BREAK | |
| Room 1 | IMPACT OF INDUSTRY 4.0 ON MINE SAFETY Chairman: prof. Derek Apel | |
| 15:00-15:15 | Tomasz Cierpisz | SYBET-PROXIMA anti-collision support system for the operator's work |
| 15:15-15:30 | Alicja Szmigiel Derek Apel | Predicting the stability of open stopes using Machine Learning |

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| 15:30-15:45 | Andrea Segalini Alessandro Valletta Andrea Carri Roberto Savi | A three-dimensional approach to automatic monitoring of underground constructions |
| 15:45-16:00 | Miłosz Bąk | The use of automatic measurement techniques in the geotechnical monitoring system of PGE GiEK S.A, KWB Turów branch |
| 16:00-16:15 | Bogacki Sławomir | Computer visualization in creating pro-safe attitudes of employees |
| 16:15-16:30 | Justyna Sz wajca Ewa Dąbrowska | Study of the variability of the quality parameters of the "Turów" lignite deposit with the use of digital models. |
| 16:30-16:45 | Diego Sancho Calderón Sven Bock Jürgen Franz | Advanced engineering tools for mine shaft design, construction and monitoring |
| 16:45-17:00 | Chao Wang Jianhui Xu Kegang Li Zonghong Zhou Yuefeng Li | BP neural network model optimization for rockburst prediction considering sample sizes, optimization algorithms and dimensionless methods |
| 17:00-17:15 | Piotr Mertuszka Marcin Szumny Krzysztof Fuławka | Next generation carbon neutral pilots for smart intelligent mining systems – NEXGEN-SIMS |
| 17:15-17:30 | Menghan Wei Xueqiu HE Dazhao Song Shan Yin Xianghui Tian | Vector characteristics of electromagnetic radiation generated from rock fracture |
| 17:30-17:45 | Cui Hongqing He Xing Wang Zehua | 4D gas geological research on coal seam with gas hazard potential in mining panel |

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| 17:45-18:00 | Kornel Kwast | Bogdanka: coal mine - data mine. ABB AbilityT solutions for longwall complex |
| 18:00-18:15 | Krzysztof Stasch Maya Ilieva Grzegorz Józków Jan Kapłon | Remote sensing techniques for surface deformation monitoring and risk assessment in USCB |
| END OF THE SESSION | | |
| Room 2 | ENVIRONMENTAL SUSTAINABILITY IN MINING Chairman: prof. Adam Smoliński | |
| 9:45-10:00 | Tomasz Cudny Adam Oleś | Directions for counteracting climate change in the JSW Group's strategy |
| 10:00-10:15 | Tomasz Rogala | Transition challenges for the mining sector in terms of efficiency and pro-environmental investments in PGG S.A. |
| 10:15-10:30 | Vitaly Zhironkin Dawid Szurgacz Jiří Pokorný | New approach for studying Ecological and Economical problems of Kemerovo mine region |
| 10:30-10:45 | Baisheng Nie Xiaotong Wang Jie Gong Feifei Yin Fanbei Kong | Carbon Neutral Path of Coal Gas in China |
| 10:45-11:00 | Angelika Więkol-Ryk Alicja Krzemień | Land reclamation of coal mine affected areas in highly acidic waste heaps |
| 11:00-11:15 | Sławomir Wochna | Modern KWB Turów mine. Technical innovations and pro-ecological solutions. |
| 11:15-11:30 | Izabela Jonek- Kowalska Marian Turek | Economic situation of cities in the post-mining regions in Poland |
| 11:30-11:45 | Gąsior Rafał Smoliński Adam | Use of coals and wastes in a co-gasification process aimed at producing hydrogen-rich gas |

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| 11:45-12:00 | Dong Xuanmeng Guo Liwen Dong Xianwei Wang Fushen | Spectroscopic study on molecular structure of raw coal from Daliuta coal mine |
| 12:00-12:15 | Yuan Junwei Wang Yao Chen Xiangjun | Study on the Evolution of Pore Structure of Anthracite Coal under LN2 Freeze-Thaw Cycles |
| 12:15-12:30 | Sławomir Wochna Natalia Howaniec Adam Smoliński | Gasification of bituminous coal from Turów coal mine to hydrogen-rich gas |
| 12:30-12:45 | Yanwei Liu Jian Miao Haojie Jia Hongkai Han | Experimental Study on Gas Transport Law for Transitional Flow in Porous Media - |
| 12:45-13:00 | Rafał Baron Piotr Matusiak Daniel Kowol Marcin Talarek | Concentration of rare earth elements in the Polish power plant wastes |
| 13:00-13:15 | Jian Zhao Guangping Huang Lin Liao Wei Victor Liu | Performance of calcium sulfoaluminate cement-based grouts at cold temperatures |
| END OF THE SESSION | | |
| LUNCH | | |
| 14:15-14:35 | Keynote speech by Prof. Petr Konicek | |
| 14:35-14:55 | Keynote speech by Prof. Rudrajit Mitra | |
| 14:55-15:00 | BREAK | |
| Room 2 | PREDICTION AND PREVENTION OF NATURAL HAZARDS IN MINING, Chairman: dr Zbigniew Lubosik | |
| 15:00-15:15 | Shuting Miao Petr Konicek | Numerical modelling of distress blasting - A state-of-the-art review |

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| | Pengzhi Pan Hani Mitri | |
| 15:15-15:30 | Mariusz Kosiński Łukasz Herezy | Combating the climate hazard in the area of longwall panel 1/VIII/391 in the Stefanów Field – increasing the cooling capacity of central air conditioning by changing the refrigerant from ice water to binary ice |
| 15:30-15:45 | Ting Ren Alex Alex Remennikov Dulara Kalubadanage Xiaohan Yang | Development of a protective structure on Continuous Miners against coal burst hazards |
| 15:45-16:00 | Rickard Hansen | Proposed design fire scenarios for underground hard rock mines |
| 16:00-16:15 | Chunchen Wei Chengguo Zhang John Watson Ismet Canbulat | Assessment of ejection velocity using a coupled model in coal excavations |
| 16:15-16:30 | Zhou Chao Xue Qiu He DA-zhao SONG Zhen lei Li Yang Liu Lei Guo | Study on signal characteristics of burst tendency coal under different loading rates |
| Room 2 | RISK ASSESSMENT & SAFETY MANAGEMENT, Chairman: prof. Alicja Krzemień | |
| 16:30-16:45 | Roman Gaška Marcin Kruk Zbigniew Wolny Mariusz Myrlak Tomasz Karpiel | Optimization of the technology for testing the safety circuit of the mining shaft hoisting machine by applying the criterion of safety maximization while minimizing the downtime for the required tests and inspections. |

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| 16:45-17:00 | Bentkowska Anna | The psychological aspect of crisis management in the face of a pandemic |
| 17:00-17:15 | Rickard Hansen | The activation of fire suppression systems on mining vehicles – what happens after that? |
| 17:15-17:30 | Ochman Grzegorz | Web application supporting operations of OHS services of PGG S.A. based on the client (JS / Angular) - server (PHP / Laravel) architecture |
| 17:30-17:45 | Tomasz Cierpisz | PORTAS-EPIDEMIA epidemic suppression system in underground mining plants |
| 17:45-18:00 | Dawid Klimanek | Innovative training methods at PGG S.A. |
| 18:00-18:15 | Karol Dworak Sławomir Bojarczuk | Underground roadways convergence monitoring with the use of laser scanning |
| END OF THE SESSION | | |

| Tuesday, November 23rd | | |
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| 9:00-9:30 | Keynote speech by Prof. Raymond J. Durrheim | |
| BREAK | | |
| Room 1 | PREDICTION AND PREVENTION OF NATURAL HAZARDS IN MINING, Chairman: prof. Petr Konicek | |
| 9:45-10:00 | Zhenlei Li Dazhao Song Xueqiu He Shirui Lan Taoping Zhong | Rockburst induced by pillars and hard-thick roof in shallow multiple coal seam mining |
| 10:00-10:15 | Bei Pei Yaxiang Kang Zhiyin Zhu Liwei Chen Rongkun Pan Minggao Yu Guoxun Jing | Acceleration characteristics of compound flame in the initial stage of gas/coal dust explosion |
| 10:15-10:30 | Zarina Mukhamedyarova Fidelis Suorineni | Backfill strength mobilization monitoring with time |
| 10:30-10:45 | Jon Roberts Rongfu Liao Peter Wypych | Development of Simulation Methods for Dust Suppression System Design in Mining |
| 10:45-11:00 | Zulfiqar Ali Murat Karakus Giang D. Nguyen Khalid Amrouch | Effect of Loading Rate and Time Delay on the Tangent Modulus Method (TMM) in Coal and Coal Measured Rocks |
| 11:00-11:15 | Jianli Shao Wenquan Zhang Xunan Wu Yu Lei Xintao Wu | A coupled stress-seepage-damage model and its application in water inrush from faults |

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| 11:15-11:30 | Shahe Shnorhokian Hani Mitri | Quantifying the Influence of Variations in Rock Mass Properties on Stope Stability |
| 11:30-11:45 | Magdalena Wróblewska Marcin Grygierek | Assessment of visual representation methods of linear discontinuous deformation zones in the right-of-way |
| 11:45-12:00 | Zeng Qingliang Xu Penghui Meng Zhaosheng Wan Lirong | Dynamic response analysis of four leg hydraulic support under impact load |
| 12:00-12:15 | Paweł Piasecki Robert Michułka Krzysztof Kujawski Radosław Miller | Exploitation of a copper ore deposit in the conditions of reduced thickness of dolomite-anhydrite rocks (adjacent to the tertiary layers) on the example of the LU-XV/16F mining district in the Lubin Mine |
| 12:15-12:30 | Yu Lei Wenquan Zhang Jianli Shao Xunan Wu Zaiyong Wang Xintao Wu | Study on fault activation characteristics and grouting simulation under fluid solid coupling |
| 12:30-12:45 | Dong Xianwei Li Gaojing Dong Xuanmeng Wang Fusheng | Study on the effect of coal microscopic pore structure to its spontaneous combustion tendency |
| LUNCH | | |
| 14:00-14:20 | Keynote speech by prof. Ting Ren | |
| 14:20-14:40 | Keynote speech by prof. Şebnem Düzgün | |
| BREAK | | |

| Room 1 | MINING PRODUCTIVITY AND EFFICIENCY Chairman: dr Tomasz Rogala | |
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| 15:00-15:15 | Łukasz Herezy Sebastian Buczak Dawid Osowski Bartosz Rożnawski | Influence of changes in longwall panels' parameters on technology and cost effectiveness |
| 15:15-15:30 | Tomasz Grzyśka | A longwall system with a significantly higher efficiency work cycle |
| 15:30-15:45 | Paweł Śliwiński | Application of the Monitoring System for Self-Propelled Mining Machines in KGHM PM S.A. |
| 15:45-16:00 | Duong Duc Hai Dao Hong Quang Phan Van Viet | Status and prospects of fully mechanized mining technology in Vietnamese coal mines |
| 16:00-16:15 | Jacek Korski | Roadway development efficiency - factors , aspects and constraints |
| 16:15-16:30 | Łukasz Bednarczyk | Digitalization of the process of traction calculations for underground transport systems in the mines of PGG S.A. |
| 16:30-16:45 | Leszek Kwiska Marcin Świerczek | Cooperation of mine rescue with other units and rescue services in the country and abroad |
| 16:45-17:00 | Dawid Szurgacz | Powered roof support operating in changing mining and geological conditions |
| 17:00-17:15 | Piotr Buchwald Jan Syty | Predicted heat strain as the basis for planning rescue work in a hot environment |
| 17:15-17:30 | Andrzej Kleszcz Paweł Wachowicz Adam Szadurski | Maintaining the readiness of the Mine Rescue Unit in the event of a pandemic |
| 17:30-17:45 | Sylwester Rajwa Sven Bock | Optimization of selected parameters of the base of shield support dedicated for the condition of a weak floor |
| 17:45-18:00 | Tomasz Cierpisz | SWAR-II new wireless system to support rescue operations in underground mining plants |
| 18:00-18:15 | Tomasz Budniok | Modern underground mining transport systems |

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| | Mariusz Boruszko Bernard Krakowczyk Andrzej Tor Wojciech Zasadni Leszek Żyrek | with regard to limiting adverse on the working environment |
| END OF THE SESSION | | |
| Room 2 | OCCUPATIONAL HEALTH AND SAFETY IN MINING Chairman: dr Isaac Vennes | |
| 9:45-10:00 | Ahmad Zueter Saad Akhtar Agus Sasmito | Uncertainty Analysis Using Monte Carlo of Selective Artificial Ground Freezing Systems for the Safety of Deep Underground Mine |
| 10:00-10:15 | Władysław Witkowski Jerzy Latko | Innovative technical solutions used in the mining shaft hoist to increase work efficiency and safety at TAURON Wydobywanie S.A. ZG Janina |
| 10:15-10:30 | Rachid Halabi Mustafa Kumral | Special safety issues in mines located in remote areas and extreme weather conditions |
| 10:30-10:45 | Dariusz Kołodziejczyk | The experiences of Polska Grupa Górnicza S.A. in the selection of appropriate personal protective equipment and employee equipment. |
| 10:45-11:00 | Łukasz Mazurkiewicz Paweł Baranowski Michał Kucewicz Jerzy Małachowski Krzysztof Damaziak | Modelling and optimization studies in support of blasting work in the copper ore mines |
| 11:00-11:15 | Jan Syty Dariusz Radoń Roman Wolski | Specialized rescue work during failure of shaft lifts |
| 11:15-11:30 | Lishuai JIANG, Yang ZHAO, Qing XU, Xingyu WU | Preliminary Study on the Fractured Rock Mechanics with Sand-powder 3D Printing |

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| 11:30-11:45 | Jean-Pierre K. Tshibangu Fanny Descamps | How understanding true triaxial stress states can help in assessing the safety of mine openings? |
| 11:45-12:00 | Michał Patyk Dagmara Nowak- Senderowska | Occupational risk based on employees' knowledge and awareness of hazards in mining |
| 12:00-12:15 | Elie Abou-Jaoude | Transformational leadership and human consciousness in the context of safety management in the mining industry |
| 12:15-12:30 | Dalija NAMJESNIK Jannes KINSCHER | Impact of past mining on public safety – Gardanne abandoned coalmine (France) |
| 12:30-12:45 | Przemysław Kotniewicz Marek Michałjow Mariusz Koszyk | Mining rescue during the transformation of hard coal mining, directions of changes |
| 12:45-13:00 | Arend Spath Bharath Belle | The use of Longwall Active Explosion Barriers to mitigate the risk of explosions |
| END OF THE SESSION | | |
| LUNCH | | |
| 14:00-14:20 | Keynote speech by prof. Ting Ren | |
| 14:20-14:40 | Keynote speech by prof. Şebnem Düzgün | |
| BREAK | | |
| Room 2 | GROUND CONTROL & STRATA MONITORING Chairman: prof. Mitra Rudrajit | |
| 15:00-15:15 | Michał Marciniak Michał Kowalski | Geomechanical Model of Bogdanka Coal Mine |
| 15:15-15:30 | Andre Vervoort | Modelling of upward surface movement above abandoned coal mines in the Campine coal basin |
| 15:30-15:45 | Tomasz Kuchta | Development of power roof support monitoring system at JSW |

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| 15:45-16:00 | Lihai Tan Linming Dou Jian Sun Shikang Song Xiaohan Yang | Fracture Features of Brittle Coal under Uniaxial and Cyclic Compression Loads |
| 16:00-16:15 | Maria Przyłucka Zbigniew Kowalski Zbigniew Perski | Twenty years of mining induced subsidence in the USCB in Poland identified using InSAR |
| End of the session | | |
| Room 2 | FROM HAZARD TO RESOURCE: COALBED/MINE METHANE. MEGA project dissemination Chairman: dr KRZYSZTOF KAPUSTA | |
| 16:15-16:30 | Renata Cicha-Szot, Grzegorz Leśniak Tomasz Topór Małgorzata Słota- Valim Paweł Budak Bartłomiej Jura Janusz Makówka Jacek Skiba Marcin Karbownik Daniel Brunner | Application of long-reach directional drilling for gas drainage of adjacent seams in coal mines with severe geological conditions |
| 16:30-16:45 | Krzysztof Kapusta Krzysztof Stańczyk Alicja Krzemień Hywel Thomas Renato Zagorscak Sevket Durucan Anna Korre Thomas Kempka Christopher Otto Natalie Nakaten Elena Chabab Olga Solcova | MEGAPlus: Unconventional Methane Production from Combined CBM-UCG Technology under the EU Research Fund for Coal and Steel (RFCS) |

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| | Karel Soukup Stephane Lafortune Farid Laouafa Chris Williams Bartłomiej Bezak | |
| 16:45-17:00 | Renata Cicha-Szot Paweł Budak Tadeusz Szpunar Marcin Majkrzak | Wellbore Stability in Horizontal CBM wells: Practical solutions to Better Understand the Uncertainty in Rock Strength and Coal Heterogeneity in the Upper-Silesian Coal Basin |
| 17:00-17:15 | Weiqin Zuo Wenming Zhang Yanwei Liu Hongkai Han Cheng Huang Wenji Jiang Hani Mitri | Study on Damage of Coal Pore Structure by Clean Fracturing Fluid |
| 17:15-17:30 | Paweł Hyla Roman Gaška Adam Musialik | Mining of longwalls with a high concentration of methane at TAURON Wydobywanie S.A. ZG Brzeszcze, methods of ventilating, monitoring and combating the methane hazard and the economic use of the captured methane. |
| 17:30-17:45 | Artur Badylak | Activities of Jastrzębska Spółka Węglowa S.A. in the context of the upcoming European Commission' s methane strategy |
| 17:45-18:00 | Ndongala Mabeka Jean-Pierre K. TSHIBANGU Fanny DESCAMPS | An approach to assess the recoverable methane gas of Belgian abandoned coalmines |
| END OF THE SESSION | | |