

XIX
2026

International Society
for Mine Surveying
Congress

VENUE: CENTURY CITY CONFERENCE CENTRE,
CAPE TOWN

21 SEPTEMBER 2026 – TECHNICAL VISITS 22-24
SEPTEMBER 2026 – CONFERENCE

Hosted by Institute of Mine Surveyors of Southern
Africa and the International Society of Mine Surveying.





Organised by the Southern African
Institute of Mining and Metallurgy.



ECSA Validated CPD Activity, Credits = 0.1
points per hour attended. SAGC Validated Activity.

PROGRAMME

XIX ISM CONGRESS 2026

Day 1: Monday 21 September 2026 – Technical Visits

Day 2: Tuesday 22 September 2026

07:00–08:00	Registration and Early Morning Refreshments	08:45–09:15	Day 1 Plenary Keynote: The Capability Constraint Our Industry Can No Longer Ignore Rebuilding the Pathway from Education to Competent Practice Across the Minerals Industry Mr. G Lane, Vuuma Collaborations
08:00–08:05	Safety Briefing Venue Official		
08:05–08:15	Welcome and Opening by the Congress Chairperson Prof. H Grobler, University of Johannesburg		
08:15–08:30	IMSSA Presidential Address Mr. T Tsotetsi, IMSSA President	09:15–09:20	Sponsor Presentation, Esri South Africa Mr. S Martin
08:30–08:45	SAIMM Presidential Address Mr. T Mmola, SAIMM President	09:20–09:25	Sponsor Presentation, Leica Geosystems (Pty) Ltd
			 esri South Africa
			 HEXAGON
			

PARALLEL SESSIONS

Parallel Session A

Commission 1 Commission Chair: Prof. B Zhengu
Education, Legal Issues, Web Presentation and History

09:25–09:45	The University of South Africa’s Recognition of Prior Learning Programme is Enhancing the Technical Skills of Assistant Mining Surveyors L L Yende, University of South Africa, South Africa
09:45–10:05	Reimagining Mine Surveying Workflows with WebGPU Rendering and AI-Driven CAD Automation A C Barnard, Mineware, South Africa
10:05–10:25	Mid-Morning Refreshments
10:25–10:45	Skills Needs in an Occupation at Risk: Surveyor Assistants at Surface Coal Mines in Mpumalanga V NaamdheW and P Ramsarup, University of the Witwatersrand, South Africa
10:45–11:05	Mine Survey Practice in South Africa: Rebuilding the Professional Pipeline H C I Grobler and F T Cawood, University of Johannesburg and Sibanye-Stillwater, South Africa
11:05–11:25	Transparent Technology System for Mine Engineering Practice Z. Liu, W. Li, F. Cawood and Y. Gong, Universities of Johannesburg and the University of the Witwatersrand, South Africa

Parallel Session A

Commission 2 Commission Chair: Prof H Grobler
Geometry of Mineral Deposits and Mineral Resource Management

11:25–11:45	A Decade of Evolution: Integrating Multi-Platform InSAR for Holistic Stability Monitoring at Debswana’s Diamond Operations A. Mkandla, B. Saadia, F. Bellotti and I. Kgakgamatso, TRE Altamira, South Africa
11:45–12:05	Models of Dynamic Manifestation of Rock Pressure in Underground Mining of Gold Ore Deposits S. Sayyidjabbor, A. Nizamova and A. Kazakov, Tashkent State Technical University named after Islam Karimov, Uzbekistan
12:05–13:05	Lunch

Parallel Session B

Commission 3 Commission Chair: Mr. T Tsotetse
Instruments, Mine Surveying Measurements and Mining Cartography

09:25–09:45	Comparative Evaluation of Precision and Accuracy of a Total Station versus Tripod-Based Terrestrial Laser Scanner and a Handheld Laser Scanner in Underground Tunnel Profiling K M Mmolotsi, University of Johannesburg, South Africa
10:05–10:25	Mid-Morning Refreshments
10:25–10:45	SHAFT-2-BIM: Advanced 3D Mapping, Modelling and Asset Lifecycle Monitoring of Mine Shafts T. Phakoe, M. Weber and K. Zimmermann, DMT Group, Germany
10:45–11:05	Advancing Mine Operations Through LiDAR-Based Shaft Digitisation R.J.P. Lopes, Delta Scan, South Africa
11:05–11:25	From Pegs to Algorithms: How Surveyors Are Reclaiming Control of Grade at the Dig Face O.J. Spreng, OPTRON Mining, South Africa

11:25–11:45	Development of an Intelligent Supervision System for River and Lake Sand Mining W. Liu, North China University of Water Resources and Electric Power, China
11:45–12:05	A Framework for Enhanced Mine Planning Using Optimization and Parametric Design in the Cloud C. Poblete, I. Buitrago and J. Gonzalez, GEOVIA Dassault Systèmes, Chile
12:05–13:05	Lunch

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Day 2 – Tuesday 21 September 2026 continued

PARALLEL SESSIONS

Parallel Session A continued

Commission 2 Commission Chair: Prof H Grobler

Geometry of Mineral Deposits and Mineral Resource Management

- 13:05–13:25 **The Assessment of the Conversion of a Copper Gold Mineral Resource to a Mineral Reserve**
L.N. Ramokonyane and M. Mpanza, *University of Johannesburg, South Africa*
- 13:25–13:45 **Engineering Technology System and Engineering Practice of Transparent Mine System**
Z. Liu, W. Li, F. Cawood and Y. Gong, *Wuhan University, China*
- 13:45–14:05 **Genesis and Mode of Occurrence of Magnetite–Rich Iron Ore within Gabbronorite of the Bushveld Igneous Complex: Evidence from Petrography, XRD, and Geochemistry**
J.M. Maponya, H.R. Mundalamo and J.S. Ogola, *University of Venda, South Africa*
- 14:05–14:25 **Afternoon Refreshments**
- 14:25–14:45 **Point Cloud Semantic Segmentation and Solid 3D Modelling Technology for Underground Mine Tunnels**
M. Ji, P. Song, F. Ji, G. Zhang, R. Xu and J. Zhu, *Shandong University of Science and Technology, China*
- 14:45–15:05 **The Use of In-Pit Mapping to Validate RC Drilling Data at Mogalakwena Platinum Mine**
S. Chetty, S. Gumbie and P. Kalpakiotis, *Valterra Platinum, South Africa*
- 15:25–15:30 **Close of Conference Day 1**
- 15:30–18:25 **Networking Cocktail Function**

Parallel Session B

Commission 4 Commission Chair: Mr. N Mojapelo

Rock and Ground Movements and Subsidence Damage

- 13:05–13:25 **Research on Monitoring Technologies and Overburden Subsidence Prediction Methods for Mine Exploitation**
Q. Hu, *North China University of Water Resources and Electric Power, China*
- 13:25–13:45 **Mining Subsidence Characteristics of Overburden Separation Grouting in Longwall Mining of Thick Coal Seams**
W. Guo and Y. Hu, *Henan Polytechnic University, China*
- 13:45–14:05 **Monitoring and Predicting Underground Mining-Induced Three-Dimensional Displacements by Integrating InSAR and Rock Strata Movement Knowledge**
Z. Yang, C. Zhou, Z. Li and J. Zhu, *Central South University, China*
- 14:05–14:25 **Afternoon Refreshments**
- 14:25–14:45 **Stress Response and Deformation Characteristics of Surface Slopes Under Goaf-Induced Mining Disturbance**
J. Long, *Taiyuan University of Technology, China*
- 14:45–15:05 **Sustainable Subsurface Planning and Engineering: Management and Monitoring of Underground Energy and Storage Systems in Germany**
M. Gurgel, *RWTH Aachen University, Germany*
- 15:05–15:25 **Intelligent Microseismic Monitoring Method for Roof Fracture in the Process of Coal Seam Water Infusion**
X. Zhang, *Taiyuan University of Technology, China*
- 15:25–15:30 **Close of Conference Day 1**
- 15:30–18:25 **Networking Cocktail Function**

Day 3 – Wednesday 22 September 2026

- 07:00–08:00 **Registration and Welcome Refreshments**
- 08:00–08:05 **Safety Briefing**
- 08:05–08:10 **Opening and Welcome**
Prof H Grobler
- 08:10–08:40 **Day 2 Plenary Keynote**
Mr C Hutton

- 08:40–08:45 **Sponsor Presentation, Dwyka Mining Solutions** 
- 08:45–08:50 **Sponsor Presentation, Horts Mining Solutions** 

PARALLEL SESSIONS

Parallel Session A

Commission 4 continued Commission Chair: Mr N Mojapelo

Rock and Ground Movements and Subsidence Damage

- 08:50–09:10 **Observation Station in Linxi: China's First Surface Movement Observation Station**
H. Dai, Z. Deng, Y. Yan, J. Hu, P. Wu, X. Zhang and X. Tian, *China University of Mining and Technology, Beijing, China*

Parallel Session B

Commission 5 Commission Chair: Ms. G Mokhitli

Environmental Planning

- 08:50–09:10 **Commission 5 Keynote Address**
Mine Surveying Science and Technology for Contemporary and Future Mining Industries
Prof. B Zhengfu, *China University of Mining and Technology, China*

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Day 3 – Wednesday 22 September 2026 continued

PARALLEL SESSIONS

Parallel Session A

Commission 4 continued **Commission Chair:** Mr N Mojapelo
Rock and Ground Movements and Subsidence Damage

- 09:10–09:30 **Mechanism, Prediction and Instability Risk Assessment of Long-Term Ground Deformation in Closed Mines**
Q. Guo, Anhui University of Science & Technology, China
- 09:30–09:50 **Multi-Source Predictive Modelling of Deformations in Overlapping Underground Deposits**
A. A. Malinowska, R. Hejmanowski, and A. Kwinta AGH University of Krakow, University of Agriculture in Krakow, Poland
- 09:50–10:10 **Mid-Morning Refreshments**
- 10:10–10:30 **Development of Similar Material Simulation Technology for Mining-Induced Subsidence**
H. Ling, China University of Mining and Technology, China
- 10:30–10:50 **Mechanism of Abnormal Strata Movement and Subsidence Control for Deep Mining under Weakly-Cemented Overlying Strata**
J. Zha, China University of Mining and Technology, China
- 11:50–12:50 **Lunch**
- 12:50–13:10 **Mine Surveying-Based Framework for Post-Closure Management of Salt Mines**
A.A. Malinowska and D. Kurdek, AGH University of Science and Technology, Poland
- 13:10–13:30 **Reconstruction of Subsidence Data for the Overlying Rock Mass and Ground Surface from Measurements on an Evolving Monitoring Network at the Yakovlevskoye Deposit**
V.V. Musikhin, N.A. Anokhin and D.Kh. Gilyazev, Perm National Research Polytechnic University, Russia
- 13:30–13:50 **Data-Driven Approach to Monitoring and Assessment of Post-Mining Ground Conditions: Results from the Babina Brown Coal Mine, Poland**
A. Buczynska, N. Walerysiak, K. Reclik and J. Blachowski, Wroclaw University of Science and Technology, Poland
- 13:50–14:10 **Qualifying the Impact of Mining Subsidence on Road Infrastructure in Merriespruit, Virginia, Free State, South Africa, Using RTK-GPS Surveys**
P. Pule and F. Mulenga, University of South Africa, South Africa
- 14:10–14:30 **Monitoring, Prediction and Management of Ground Movements above Underground Energy Storage: Results from a Bilateral Research Project between Poland and Germany**
J. Benndorf and J. Blachowski, TU Bergakademie Freiberg, Germany
- 14:30–14:50 **Afternoon Refreshments**

Parallel Session B

Commission 5 continued **Commission Chair:** Ms. G Mokhitli
Environmental Planning

- 09:10–09:30 **Multi-Source Predictive Modelling of Deformations in Overlapping Underground Deposits**
A. A. Malinowska, and R. Hejmanowski, AGH University of Krakow, A. Kwinta, University of Agriculture in Krakow, Poland
- 09:50–10:10 **Mid-Morning Refreshments**
- 10:10–10:30 **Discussion on Several Issues Related to Mine Ecological Restoration**
Y. Lv, Taiyuan University of Technology, China
- 10:30–10:50 **Temporal Projections of Land Use Patterns and Ecosystem Services Valuations for Mine Closure Alternatives: A Case Study**
J. Li, Y. Han, Y.P. Chugh, H. Liang and Z. Hu, China University of Mining and Technology and Southern Illinois University, China and USA
- 10:50–11:10 **Environmental Impacts and Unrehabilitated Land Due to Illegal Sand Mining: A Case Study from Pankop Masobye Pankop**
K. Maswanatso, University of Johannesburg, South Africa
- 11:10–11:30 **Synergistic Integration of GIS and Remote Sensing for Enhanced Environmental Rehabilitation Planning in Coal Mining Landscapes**
A.R. Sabao and L. Mapasure, Zimbabwe School of Mines, Zimbabwe
- 11:30–11:50 **Scale-Dependent Bias in Methane Inventories: Satellite Observations Reveal Overestimation from Large Coal Mines in China**
W. Chen, China University of Mining and Technology, Beijing, China
- 11:50–12:50 **Lunch**
- 12:50–13:10 **Flagship Project of Ecological Restoration, “The Shan-Shui Initiatives” in China: New Approach, Integrated Objectives, and Implications**
S. Zhang, C. Xu, H. Hou and Y. Yang, China University of Mining and Technology, China
- 13:10–13:30 **Plenty without Prosperity: Why Mining Communities Remain Deprived Despite Resource Abundance**
N. Mojapelo, African Wilddogs Resources, South Africa

Commission 6 Commission Chair: Ms. T Machaba

Economic Transformations, Sustainable Development, Land Reclamation and New Energy Resources

- 13:50–14:10 **Monitoring Abandoned Mines and Illegal Mining Activities in Limpopo Province Using Advanced Remote Sensing Techniques**
D. Netshiyavha, T. Gcuda, R.T. Masethe and B. Mutandwa, University of the Witwatersrand, South Africa
- 14:30–14:50 **Afternoon Tea Break**

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Day 3 – Wednesday 22 September 2026 continued

PARALLEL SESSIONS

Parallel Session A

Commission 4 continued **Commission Chair:** Mr N Mojapelo
Rock and Ground Movements and Subsidence Damage

14:50-15:10	Multi-platform Laser Scanning Detection and Attitude Correction in Mine Goaf Areas J. Wang, <i>Shandong University of Science and Technoloy, China</i>
15:10-15:30	Impact of Climate Change on Soil Permeability and Groundwater Dynamics in the LW Bogdanka Mining Area B. Stypiński, <i>Lubelski Węgiel Bogdanka S.A., Poland</i>
15:30-15:50	GeoRisk-Analyser: Movable, Self-Sufficient and High-Precision Deformation Monitoring of Geohazards with Analysis Software as a Service F. Kubisch, G. Giebler, J. Benndorf, E. Börner, M. Sodmann, M. Oldenettel and H. Böhme, <i>TU Bergakademie Freiberg, Germany</i>
16:10-17:00	Time at Leisure
17:00-17:15	Delegates meet at Century City for departure at 17:45 for Moyo Kirstenbosch
17:15	Transport Departure to Moyo Kirstenbosch
17:50-20:00	Conference Dinner, Moyo Kirstenbosch

Parallel Session B

Commission 6 **Commission Chair:** Ms. T Machaba
Economic Transformations, Sustainable Development, Land Reclamation and New Energy Resources

14:50-15:10	Intelligent Recognition Method for Multi-Scene Ecological Restoration of Open-Pit Coal Mines Based on High-Resolution Remote Sensing R. Gong, <i>China University of Mining and Technology, China</i>
15:10-15:30	Air-Ground Collaborative Multi-Source Remote Sensing Monitoring Method for Above-Ground Biomass of Arbors in Mining Areas X. Lian, L. Wang, P. Gao, J. Yuan, Y. Chen, Y. Cai and H. Hu, <i>Taiyuan University of Technology, China</i>
15:30-15:50	Key Technologies for Precise Monitoring of Surface Damage and Ecological Restoration under Repeated Mining Disturbance of Multiple Coal Seams in Daliuta Coal Mine, China Y. Zou, <i>Henan Polytechnic University, China</i>
15:50-16:10	Recent Development Trends and Future Prospects of Mine Surveying in China Z. Yuan and L. Cai, <i>Henan Polytechnic University, China</i>
16:10-17:00	Time at Leisure
17:00-17:15	Delegates meet at Century City for departure at 17:45 for Moyo Kirstenbosch
17:15	Transport Departure to Moyo Kirstenbosch
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Day 4 – Thursday 24 September 2026

07:00–08:00 **Registration and Early Morning Refreshments**

08:00–08:05 **Safety Briefing**

08:05–08:10 **Opening and Welcome**
Prof H Grobler

08:10–08:40 **Day 3 Plenary Keynote: From Data Overload to Decision Clarity: How Domain-Aligned AI is Redefining Mining and Surveying**
Prof Fred Cawood

08:40–08:45 **Sponsor Presentation, Premier Mapping Africa (Pty) Ltd**



Session A

Commission 4 continued **Commission Chair: Mr. N Mojapelo**

Rock and Ground Movements and Subsidence Damage

08:45–09:05 **AIMON 5.0: Real-Time Monitoring of Gravitational Mass Movements for Enhanced Slope Condition Monitoring in Mining Operations**
K. Zimmermann, T. Gcuda and T. Phakoe, DMT GmbH & Co. KG, Germany

09:05–09:10 **Sponsor Presentation RPMGlobal**

09:10–09:30 **Integrating GeoMoS Monitoring and InSAR for Subsidence Mapping at the Palabora Open-Pit Mine**
D.R. Khumela, Palabora Mining Company, South Africa

09:30–09:50 **Confined-Space Drone-Based Mapping and Analytics for Ore Pass Audits and Rehabilitation**
D. Epstein, Delta Scan, South Africa

09:50–10:10 **Transformation of Mining Regions and the Use of Underground Space in Germany**
A. Preusse, RWTH Aachen University, Germany

10:10–10:30 **Mid-Morning Refreshments**

10:30–10:50 **Digital Transformation in Underground Production at Efemçukuru Gold Mine: Integration of LiDAR, Robotic Total Station, and Autonomous Drilling Technologies**
O.E. Ozsoy and B. Salar, Eldorado, Türkiye

10:50–11:10 **Deep Tech for Deep Earth: SLAM-Based Robots for Next-Level Geomonitoring**
J. Li and J. Benndorf, TU Bergakademie Freiberg, Germany

11:10–11:30 **UWB-based Spatial Positioning in China's Underground Coal Mines**
Z. Lian, Henan Polytechnic University, China

11:30–11:35 **Sponsor Presentation, Gammatec NDT Supplies SOC Ltd**

11:35–11:40 **Sponsor Presentation, Optron**

11:40–12:00 **The Power of Choosing a Suitable Algorithm for UAV Data Sets in the Mpumalanga Coalfields**
L.L. Yende, University of Johannesburg, South Africa

12:00–13:00 **Lunch**

13:00–13:20 **Unmanned Ground Vehicle Path Planning for Underground Mining Environments: A Comparative Study**
A. Abdukodirov and J. Benndorf, TU Bergakademie Freiberg, Germany and Uzbekistan

13:20–13:40 **Real-Time Surface Intelligence: An Integrated Digital Terrain Workflow for Mining with Skycatch**
D. Hardenbergh, RPMGlobal

13:40–14:10 **IMSSA Awards Ceremony**

14:10–14:30 **Speech by Outgoing President**

14:30–14:35 **Handover of Presidential Medal**

14:35–15:05 **Speech by Incoming President**

15:05 **Conference Close and Afternoon Refreshments**