



MANDELA MINING PRECINCT
MINDS FOR MINES



Accelerating Mining RDI

Integrating Research Excellence
with Mining Innovation

EVENT PROGRAMME

DATE 18 November 2024

VENUE CSIR ICC, Pretoria



science & innovation

Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA



MINERALS COUNCIL
SOUTH AFRICA



CSIR
Touching lives through Innovation



Accelerating Mining RDI

Integrating Research Excellence with Mining Innovation

The mining sector is, first and foremost, a highly diverse community of people, organisations, and flows of material and information. Mining is a system of systems that include suppliers, social groups, technology developers, original equipment manufacturers, trade unions, government, academia, science councils, energy providers, infrastructure development, and many more who work in complex relationships that underpin the future of the Just Transition.

The future of mining depends on a complex system of factors – technological, technical, geological, political, environmental, human, social, and financial. Mining research must, therefore, account for this complexity of inputs, business models, and frontier expectations of a sector under siege that is simultaneously at the precipice of world-leading innovation. No single entity can 'do it' alone, and this Showcase Day is about demonstrating how the Mandela Mining Precinct (MMP) and its many collaborators in the sector are playing our small part in leveraging change for good for the future. We could have achieved nothing without the ongoing support from both the Department of Science, Technology, and Innovation, and the Minerals Council South Africa, our core funders, and our co-hosts, the Council for Scientific and Industrial Research.

Mining products are critical components of solutions to global technological, environmental, and social challenges. That the mining sector must nonetheless adapt is not in question: it is the direction, pace, method, trajectory, and outcomes of these changes that are critical to map and understand to deliver on genuine needs within the mining companies and within society at large. As the MMP moves into a new future, this is where we see ourselves contributing most meaningfully to the sector, adopting a systems lens to our research and our relationships.

This Showcase Day demonstrates the veracity of Margaret Mead's statement: *"Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has."* The MMP team is small, our hearts and minds are large, and our collaboration network extensive. I hope you can appreciate the changes this MMP collective has brought about together, as demonstrated on this Showcase Day, and that you join us as one of that collective for the future.

Take care,
Julie Courtnege

TIME	AGENDA ITEM
08:00 – 08:30	REGISTRATION
08:30 – 08:35	Safety Moment – CSIR ICC
08:35 – 08:45	Performance – Gumboot Dancers
08:45 – 09:00	Opening and Welcome <i>Julie Courtnage: MMP Executive Director</i>
09:00 – 09:15	Minerals Council Anchor Address <i>Mzila Mthenjane: Minerals Council South Africa CEO</i>
09:15 – 09:30	DSTI Anchor Speech <i>Dr Mmboneni Muofhe</i>
09:30 – 10:00	Keynote address – Confronting the Future Through Technology <i>Dr Shawn Cunningham</i>
10:00 – 10:30	TEA BREAK
10:30 – 11:30	BREAK AWAY SESSIONS
	<p>ADVANCED OREBODY KNOWLEDGE</p> <ul style="list-style-type: none"> <p>Advancing Mining Innovation <i>Vishaylin Mahadeo: The Research Institute for Innovation and Sustainability</i></p> <p>Uniting technology producers with the South African mining industry, fostering collaboration and innovation. A Kumu visualization will illustrate how these technologies interconnect and contribute to the creation of a “glass-rock” environment. This initiative seeks to enhance industry knowledge and promote the adoption of cutting-edge solutions in mining operations, culminating in a session for questions and discussions.</p> <p>Alternative diamond drilling technology “Smart Drill” <i>Dr. Abrie Oberholster: University of Pretoria</i></p> <p>A potential solution to the low drilling rates in underground diamond drilling within the South African mining industry. This approach draws on the expertise of skilled drill operators who use sensory inputs like vibration, noise, and visual feedback to adjust operational parameters in real time – such as rotational speed and rate of penetration – to optimize machine performance.</p>



TIME	AGENDA ITEM
10:30 – 11:30	BREAK AWAY SESSIONS (Continued)
	<ul style="list-style-type: none">• Refining Acoustic Algorithms for Enhanced Safety in Underground Gold Mining: A Focus on the Integrated Thermal Acoustic Device Heinrich Greeff: Council for Scientific and Industrial Research Advancing the reliability and adaptability of acoustic devices, promoting safer and more efficient practices in underground mining.• E-PEGS: Enhancing Underground Location Tracking Heinrich Greeff: CSIR This project addresses the limitations of Global Positioning System (GPS) technology in underground mining and tunneling applications, where GPS signals cannot penetrate solid materials.• Revisiting Laser-Induced Breakdown Spectroscopy for Advanced Orebody Knowledge: Demonstration Scanning Experiments Dr. Michael Van Schoor: Council for Scientific and Industrial Research Advancing the application of Laser-Induced Breakdown Spectroscopy (LIBS) as a tool for enhancing orebody knowledge in gold and platinum group metal (PGM) mining, building on previous recommendations for further research in this area.• Enhancing Underground Mining Safety with the Stratify Seeker Neil Weideman: Stratify
	<p>REAL-TIME INFORMATION MANAGEMENT SYSTEMS</p> <p>LIVE DEMO of the BASE automation engine</p> <p>Presenter: Dale Sparrow: CYBARETE</p> <p>A powerful agent-based solution transforming in-field operations with True Short Interval Control directly at the working face. Built on a first-principles approach, BASE's self-organising, modular, and incrementally scalable design enables closed-loop control, real-time data capture, and robust collaboration with in-field resources. This versatile automation engine addresses the need for reliable, autonomous operation in unconnected environments, making it an ideal solution for evolving mining and industrial challenges.</p>

TIME	AGENDA ITEM
10:30 – 11:30	BREAK AWAY SESSIONS (Continued)
	<p>Advanced Internet of Things: Solving Last Mile Connectivity Presenter: Karel Cruger: <i>Council for Scientific and Industrial Research</i></p> <p>The mining stope has traditionally been poorly instrumented, although there is a wealth of information and opportunity for optimisation. The lack of instrumentation is mostly due to the lack of reliable and cost-effective last mile wired and wireless communication systems. This session focuses on the last mile connectivity technologies, identified, developed, and implemented as part of the RTIMS program to enable full digitalisation of the stope.</p> <p>From ODAP to AI for Mining: Developing an AI Framework for SA Mining Presenters: Prof. Fred Cawood and Charlotte Jean: <i>Minserv</i></p> <p>The aim of this project is to coordinate a process for the uptake of Gen-AI, its roll-out and use by the South African mining sector through the adoption of a responsible framework for Gen-AI in mining. The project follows a methodical, sequential approach, which is the subject of this presentation. The details, status and results to date will be shared.</p>
	<p>MECHANISED MINING SYSTEMS</p> <p>Rock Engineering Pillar Design (Phase IV) Presenter: Prof. Francois Malan <i>(University of Pretoria)</i></p> <p>Investigating stiffness of the loading system at various bord and pillar mines could have a significant opportunity to increase extraction rate which would extend the mines sustainability.</p> <p>ULP equipment application study for NRHR mining Presenter: Heinrich Greeff <i>(Council for Scientific and Industrial Research)</i></p> <p>Addressing industry needs to verify the established TRL testing and assessment guidelines and procedures.</p> <p>Mechanical Rock Cutting Presenter: Kgotlelelo Teffo <i>(Mandela Mining Precinct)</i></p> <p>Industry alignment to develop design principles for mechanical rock breaking equipment applications within Au and PGM mines.</p> <p>ULP equipment Testing and Demonstration Presenter: Luke Van Wyk <i>(UP)</i></p> <p>Support the Harmony ULP trial work to verify most suitable mine design and mine extraction equipment application.</p>



TIME	AGENDA ITEM
11:30 – 12:30	BREAK AWAY SESSIONS
	<p>LONGEVITY OF CURRENT MINES</p> <p>Equipment testing and TRL 6 validation for applications in NRHR mines Presenter: Nonopha Bacela (<i>Mandela Mining Precinct</i>) Addressing the industry need to investigate solutions to establish technical readiness assessment and certification processes.</p> <p>Optimise Drilling, Charging and Blasting management systems Presenter: Gideon Masango (<i>Mandela Mining Precinct</i>) Addressing the industry's requirement to investigate solutions to optimise safer explosive charging operations, based on industry criteria.</p> <p>Dynamic Test Facility Presenter: Heinrich Greeff (<i>Council for Scientific and Industrial Research</i>) Addressing the industry need to establish the utilisation of dynamic test facilities and shortcomings to optimise utilisation and to establish quality assurance within the product testing processes.</p> <p>Product development process from TRL6 to TRL9 Presenter: Vishaylin Mahadeo (<i>RIIS</i>) Addressing the industry need to establish linkages between manufacturers, sponsors and funding organisations to invest in new technology product development.</p>
	<p>SUCCESSFUL APPLICATION OF TECHNOLOGIES CENTRED AROUND PEOPLE</p> <p>Modern training for modern mining This session will showcase contemporary training methodologies for the mining industry. Modern training providers will showcase innovative approaches, including virtual reality (VR), augmented reality (AR), simulation, and gaming techniques, designed to enhance training and support the modernization of mining practices.</p>
12:30 – 13:30	LUNCH

TIME	AGENDA ITEM
13:30 – 13:45	<p>CSIR Anchor Speech Dr Thulani Dlamini: CSIR CEO</p>
13:45 – 14:30	<p>PANEL DISCUSSION: The innovation gap between mining graduates and industry needs: Root causes and solutions.</p>
	<ul style="list-style-type: none"> • Facilitator: Sibongile Ntsoelengoe: CSIR Executive Cluster Manager: Mining • Prof John Carranza: University of the Free State • Prof Stephan Heyns: University of Pretoria • Prof Francois Malan: University of Pretoria • Dr Mulundumina Shimaponda-Nawa: University of the Witwatersrand • Dr Ingrid Watson: University of the Witwatersrand • Vanessa Naicker: Anglo American, Head of Social Impact • Raymond Ranta: Harmony Gold, Regional General Manager Northwest Operations
14:30 – 16:00	<p>BREAK AWAY SESSIONS: SAMERDI Research Centres</p>
	<p>SATCAP SAMERDI RESEARCH CENTRE – University of the Witwatersrand</p> <ul style="list-style-type: none"> • Mine waste valorisation in the Witwatersrand Goldfields: A Geometallurgical study on cyanide-free agglomeration of legacy tailings and low-grade ores <i>Carol Xolile Simelane: PhD research</i> • Integrated metal accounting approach for PGE mine waste valorisation using process mineralogy and machine learning <i>Vive Notole, PhD research</i> • Developing a technology adoption framework for collision prevention systems: an underground mine case study <i>Tanyaradzwa Mapaire, MSc research</i>



TIME	AGENDA ITEM
14:30 – 16:00	<p data-bbox="378 336 1003 363">BREAK AWAY SESSIONS: SAMERDI Research Centres (Continued)</p> <p data-bbox="325 384 1003 411">RTIMS SAMERDI RESEARCH CENTRE – University of the Witwatersrand</p> <ul data-bbox="325 421 1053 746" style="list-style-type: none"><li data-bbox="325 421 1053 480">• The socioecological consequences of informal chrome mining on rural communities in South Africa – <i>Anna Gowera: PhD research</i><li data-bbox="325 489 1053 579">• Mapping gaseous emission and particulate matter outputs from platinum smelters in South Africa using satellite data and GIS technology <i>Tamia Rambuda: MSc research</i><li data-bbox="325 588 1053 647">• Constructing the optimal Fifth Industrial Revolution matrix for a robust Mining Industry in South Africa – <i>Nandipha Sihlali: MSc research</i><li data-bbox="325 657 1053 746">• Development of a framework for identifying post mining opportunities in abandoned and closed mines South Africa <i>Zandile Dzegere: MSc research</i>
	<p data-bbox="325 767 941 794">AOK SAMERDI RESEARCH CENTRE – University of the Free State</p> <ul data-bbox="325 804 1042 1294" style="list-style-type: none"><li data-bbox="325 804 1042 893">• A framework for reducing grade uncertainty associated with orebody modelling process <i>Martha Amwaama: University of the Free State, PhD candidate</i><li data-bbox="325 903 1042 992">• Application of Multispectral Imaging to Mineralogically Describe the Mafic-Ultramafic Rocks of the Bushveld Complex <i>Nomonde Mabogo: University of the Free State, MSc Geology student</i><li data-bbox="325 1002 1042 1125">• Effects of Increasing the Dimensions of Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN) on their Performance and Accuracy of Gold Ore Grade Estimation <i>Karabo Mahlapha: University of the Free State, MSc Geology student</i><li data-bbox="325 1134 1042 1224">• Simulation of Metal Grades for Orebody Modelling <i>Ms. Tshimangadzo Ndou: University of the Free State, MSc Geology student</i><li data-bbox="325 1233 1042 1294">• Hyperspectral and Geochemical Data Fusion for Predictive Drill Core Mineral Mapping – <i>Dzhavhelo Matimbi: MSc Geology student</i>

TIME	AGENDA ITEM
14:30 – 16:00	BREAK AWAY SESSIONS: SAMERDI Research Centres (Continued)
	<p>MMS SAMERDI RESEARCH CENTRE – University of Pretoria</p> <ul style="list-style-type: none"> • A roadmap towards optimised mechanised mining systems. <i>Luke van Eyk</i> • Productivity improvement of mechanised underground mining process through simulation. <i>Dion de Villiers</i> • Integrated production optimization at a mechanized South African mine. <i>Lehlogonolo Manyakoana</i> • Developing brittleness indexes of Upper Group (UG2) Chromitite reef using mineralogical characteristics. <i>Ncedo Matukane: University of Limpopo</i> • Level 9 collision avoidance using digital twins and a hybrid modelling approach. <i>Hanno Moes</i> • A novel gearbox for producing groundbreaking robot movements. <i>Vincent Kikanga</i> • Machine vision-based localisation in underground mining. <i>Adam Neethling</i>
	<p>Closing <i>Julie Courtmagne: MMP Executive Director</i></p>
16:10 – 17:00	NETWORKING AND EXHIBITION



Speaker and Exhibitor Profiles



MR MMBONENI MUOFHE

Mr. Mmboneni Muofhe is the Deputy Director-General (DDG) for Technology Innovation at the Department of Science and Technology. He was previously DDG for International Cooperation and Resources and has held several positions at the Department, including being Chief Director: International Resources, Director: Strategic Partnerships and Director: Global Projects. During this period, he oversaw South Africa's growing participation in EU Research Funding programmes, led the mobilization of Official Development Assistance funds to support South Africa science system and the Department's partnership with Multinational Companies. Mr Muofhe's current responsibilities include overseeing the implementation of South Africa's Space Science and Technology Strategy, Bioeconomy Strategy, Energy Research and Technology Strategy, Innovation Priorities Instruments (including new Research Areas) and oversight of the IP act.



DR THULANI DLAMINI

Dr. Thulani Dlamini is the CEO of the Council for Industrial and Scientific Research (CSIR) and a member of the South African Academy of Science. His career commenced at Sasol in 1998, where he worked as a research scientist specialising in heterogeneous catalysis. In 2005, Dlamini joined the CSIR as the head of the National Laser Centre, later becoming the Group Executive: Research and Development in 2008. He returned to Sasol in 2011, serving as Executive Manager: Research and Development and later as Vice-President for Strategic Research and Technology. Dlamini holds a PhD in chemistry from the University of the Witwatersrand and a master's in business leadership from the University of South Africa. He possesses five patents in Fischer-Tropsch technology and actively participates in various boards and committees, including the UNDP South Africa.



MR MZILA MTHENJANE

Mr. Mzila Mthenjane is the CEO of the Minerals Council South Africa, representing 90% of the nation's mineral output and employment. With over 30 years in mining and financial services, he previously served as the Executive Head for Stakeholder Affairs at Exxaro Resources. Mzila has held non-executive director positions at entities such as Pamodzi Gold and Merafe Resources and was involved in stakeholder engagements at Exxaro. He is the current Chairman of the Impact Catalyst and has served in various leadership roles. Mzila holds a BSc in mining engineering from the University of Witwatersrand and has completed several leadership development programs, notably enhancing Exxaro's stakeholder engagement and ESG initiatives.



DR SHAWN CUNNINGHAM

Dr. Shawn Cunningham is a process consultant specializing in innovation and socioeconomic change, supporting institutions, leaders, and advisors on complex topics like decision-making under uncertainty, enhancing resilience within institutional networks, and fostering learning and innovation dynamics in societies. His work involves helping leadership teams or whole industries learn about new knowledge, or make sense of contradiction and uncertainty.

He is passionate about supporting industries that are lagging behind to innovate and collaborate. His clients include governments, think tanks, international development organisations, universities, and industries.



MS JULIE COURTNAGE

Ms. Julie Courtage, the Executive Director of the Mandela Mining Precinct, began her career in 1991 at Anglo American Research Laboratories and has since devoted 35 years to the mining sector. Her diverse experience includes roles in research, operations, advisory, and international liaison.

As an experienced environmental scientist and sustainability practitioner, she has focused on understanding human behavior, values, and decision-making processes—crucial elements for achieving positive environmental, economic, and social outcomes. Previously, she worked as a Sustainable Development Operations Manager at Anglo American and then spent 16 years as an independent coach, consultant, researcher, and lecturer, specializing in risk, sustainability, ethics, governance, leadership, and complex decision-making.



DR JOHN CARRANZA

Professor John Carranza specializes in geochemistry related to mineral exploration and ore genesis research. He also has expertise in spatial mathematics and statistics for predictive modeling of mineral resources, as well as remote sensing for geological and mineral exploration. He has published over 290 papers in international peer-reviewed geoscience journals and more than 90 papers in international conference proceedings. Additionally, he authored a book titled “Geochemical Anomaly and Mineral Prospectivity Mapping in GIS.”

Currently, he serves as the Editor-in-Chief of the Natural Resources Research journal and is an Associate Editor for the Journal of Ore Geology Reviews and the Journal of Geochemical Exploration.



PROF STEPHAN HEYNS

Professor Stephan Heyns is part of the Department of Mechanical and Aeronautical Engineering at the University of Pretoria, where he leads the Centre for Asset Integrity Management and coordinates a research program on mechanized mining systems with the Mining Engineering Department. His research focuses on machine condition and structural health monitoring using vibration-based techniques, especially the development of digital twins through the integration of physics-based and data-driven models. He has a strong interest in experimental vibration analysis. Professor Heyns is a Fellow of several prestigious organizations and actively contributes to international conferences and journals, holding a B rating from the National Research Foundation (NRF).



MS VANESSA NAICKER

Ms Vanessa Naicker has extensive global multi-commodity mining experience and is a registered professional engineer with the Engineering Council of South Africa, holding a master's degree in metallurgical engineering. Currently, she is the Head of Social Impact for the Africa and Australia region at Anglo American, overseeing socio-economic development and strategic programs that support thriving communities within the company's sustainable mining plan. Vanessa collaborates with stakeholders to enhance the social agenda of environmental, social, and governance (ESG) initiatives, particularly in education and job creation. Additionally, she serves as the Chairperson of the Minerals Education Trust Fund and holds various advisory roles.



MS SIBONGILE NTSOELENGOE

Ms Bongi Ntsoelengoe has over 15 years of experience in the mining industry, specialising in iron ore and base metals. She has held leadership roles, including Manager Technology at Kumba Iron Ore, where she developed integrated innovation strategy roadmaps. Currently, she is the Executive Cluster Manager for CSIR's Future Production: Mining. Bongi serves as Non-Executive Director at Fraser Alexander and is a council member of the South African Institute of Mining and Metallurgy (SAIMM). Her recent achievements include creating a research and innovation strategy roadmap for revitalising the South African mining industry and enhancing its RDI ecosystem. She holds an MBA and multiple engineering degrees.



DR INGRID WATSON

Ms Ingrid Watson has over 20 years of experience in mining and sustainable development. She is a senior lecturer at the Wits Mining Institute and the Research Lead for the Successful Application of Technology Centred Around People research centre. This program examines the human factors involved in mining modernisation, focusing on both employees and communities. Ingrid also directs the Responsible Mining Laboratory, which tackles issues related to environmental impacts, landscape changes, community development, and mine closure. Her research is mainly applied, cross-disciplinary, and collaborative. Before joining Wits, Ingrid worked in government, corporate sectors, and consulting.



MR RAYMOND WILLIAM RANTA

Mr Raymond William Ranta is a Mining Engineer with 18 years of experience, currently serving as the Regional General Manager for Harmony Gold's North West Operations. His expertise spans underground and surface mining in gold, iron ore, and chrome. He has international experience as a General Manager in West Africa, enhancing his understanding of global mining operations. A graduate of the University of Pretoria, Raymond previously focused on Operational Excellence as a Business Improvement Executive. He leads a major mine deepening project at Harmony Gold, valued at over R6.8 billion, while promoting sustainable practices and mentoring future mining professionals.



DR MULUNDINA SHIMAPONDA-NAWA

Dr. Mulundumina Shimaponda-Nawa (Mulu) is the Acting Research Centre Lead for the SAMERDI Real Time Information Management Systems (RTIMS) at the Wits Mining Institute, University of the Witwatersrand. She holds Bachelor and Master of Engineering degrees in Electrical and Electronics, and a PhD in Electrical and Information Engineering. Mulu is dedicated to enhancing systems for real-time data access to improve decision-making. Her research focuses on guiding the mining industry in developing strategies for future-ready connected mines and safe technologies that promote inclusivity, diversity, and equity. She collaborates with stakeholders to leverage artificial intelligence and machine learning for better human-machine interactions.

BOILER ROOM

THE BOILER ROOM

The Boiler Room is a South African company offering custom computer animation, motion graphics, extended reality, incident reconstruction, and other services to the mining and adjacent industries. Using the latest technologies, including Virtual, Augmented, and Mixed Reality, they can create engaging and empowering training experiences.

Their accident reconstruction services provide detailed analysis to ensure proactive safety measures and training and learning is offered according to the needs of the organisation.

 <https://boilerroom.co.za>



CIMERA

DSI-NRF Centre of Excellence (CoE) for Integrated Mineral and Energy Resource Analysis (CIMERA) is hosted by the Department of Geology at the University of Johannesburg and co-hosted by the School of Geosciences at the University of the Witwatersrand. CIMERA enables the active pursuit of world-class research through access to globally competent facilities for geoscience research, and close co-operation between universities and other geoscience research institutions, both in South Africa and internationally.

 <https://cimera.co.za/>



COALTECH

The Coaltech Research Association is a voluntary, non-profit organisation focused on addressing the research needs of South Africa's coal industry. Its primary goal is to develop technology and apply research findings to enhance the industry's competitiveness, sustainability, and safety. Key objectives include fostering collaboration among mining groups, researchers, educational institutions, and government bodies. Its research focus areas include coal processing, surface environment, mining, and future technologies, ensuring alignment with industry needs.

 <https://coaltech.co.za/>



CSIR

The Council for Scientific and Industrial Research, commonly known as the CSIR, is a world-class African research and development organisation established through an Act of Parliament in 1945. The CSIR undertakes directed, multidisciplinary research and technological innovation that contributes to the improved quality of life of South Africans. The CSIR's shareholder is the South African Parliament, held in proxy by the Minister of Higher Education, Science and Innovation.



<https://www.csir.co.za>

CYBARETTE



Cybarette is transforming industrial automation with BASE, an agent-based, distributed automation engine built from first principles to address the unique demands of modern industries. In a landscape where 21st-century IT meets 20th-century OT, BASE brings real-time, closed-loop control and secure in-field collaboration directly to operations, achieving True Short Interval Control aligned with underground and in-field plans. Self-organising, modular, and highly scalable, BASE is more than a new protocol - it's a groundbreaking approach to automation, tackling the biggest challenges of today's industries with resilience and precision.



For more info contact Dale Sparrow at sparrow@cybarette.com



<https://www.cybarette.com/>

DAL-IDENTITY



DAL Identity is the only global forensic identity management company offering fit-for-duty screening via its unique pupilometer, integrated with instant iris verification. This equitable, non-bias screening detects impairments from alcohol, drugs, fatigue, and head injury. In mining, continuous screening secures premises entry and exit. The company's comprehensive solution supports time and attendance, access and visitor management. This ensures reliable identity verification, even in harsh conditions where iris recognition outperforms fingerprint and facial options.




<https://www.dal-identity.com>



DATAGR8

DataGr8 is a South African-based company providing comprehensive cybersecurity and compliance solutions to customers across Africa. Founded in 2009, DataGr8 began with compliance email and data archiving services, soon expanding to include data migrations. DataGr8 stands at the forefront of the cybersecurity industry, dedicated to safeguarding client data and ensuring compliance with regulatory standards. The company's innovative solutions encompass cloud backup, managed detection and response, vulnerability management, cyber awareness training, and email and domain security.

 <https://datagr8.com>



DATAMINE

With over 40 years of mining innovation, Datamine is a trusted partner in the industry, offering a comprehensive range of solutions across the mining value chain. The company has a presence in over 100 countries and local offices in more than 20 nations, allowing the team to understand and meet the unique needs of global customers. Committed to the future of mining, Datamine provides cutting-edge technology that supports digital transformation and continuous improvement.

 <https://www.dataminesoftware.com>



DIGITAL SURVEYING

Digital Surveying is a specialist geoscientific formation evaluation, directional surveying, and products company that services the mining, exploration, civil engineering, and energy industries.

The company's product offering includes digital surveying tools such as the Champ Gyro and Champ Navigator, which significantly increase drilling productivity by surveying every time you pull core. Their products and services are used in various applications, including formation evaluation, directional drilling, and reservoir management and they offer digital surveying services through their Champ OSA.

 <https://www.digitalsurveying.co.za>



DIGITAL TWIN (PTY) LTD

Digital Twin (Pty) Ltd works with clients to help them identify areas where they can use technology and digital processes to improve efficiency, reduce costs, and increase competitiveness. Digital Twin (Pty) Ltd offers a range of services, including strategy consulting, process optimisation, technology implementation, and change management.

 <https://digitaltwin.digital/>



ENTERPRISES UP

The private Enterprises University of Pretoria (Enterprises UP) provides commercial research, advisory services, and short courses. Enterprises UP, which is entirely owned by the University of Pretoria, was established in 2000 as two separate organisations: Business Enterprises and Continuing Education. The two organisations were later consolidated to form Enterprises University of Pretoria (Pty) Ltd – Enterprises UP – in 2016. Since its formation, EUP has conducted work in 117 countries around the world.

 <https://www.enterprises.up.ac.za>



FLYABILITY

Flyability is a Swiss company building solutions for the inspection and exploration of indoor, inaccessible, and confined spaces. By allowing drones to be used safely inside buildings, it enables industrial companies and inspection professionals to reduce downtime, inspection costs, and risks to workers. With hundreds of customers in over 50 countries in power generation, oil & gas, chemicals, maritime, among others, Flyability has pioneered and continues to lead the innovation in the commercial indoor drone space.

 <https://www.flyability.com>



HPE

HPE, founded in 1985 and headquartered in Johannesburg, pioneers hydro-powered mining products and services. With expertise in high-pressure water hydraulics, HPE sets industry benchmarks, employing 400 skilled staff to develop equipment for South Africa's narrow tabular gold and platinum mines. Utilising high-pressure water as a clean energy source, HPE addresses health, safety, and environmental challenges. Their technology outperforms compressed air and electric systems, enabling innovative rock drilling and energy-efficient solutions, solidifying HPE's global leadership.

 <https://www.hpesa.com>



HYDROPRO

HydroPro is a proud distributor and systems integrator for NLT Digital Solutions of Australia who deployed the world's first WIFI network that is intrinsically safe for coal mines in 2005. Their parent company began in the 1935 and supplied safety products, such as cap lamps in Canada. Winners of SAI Global Systems Excellence award (2012), Good Design Award (2017) and the Queensland Export Award (2022) NLT Digital has deployed ISO 9001 certified IP67 networks for harsh environments across all continents.

 <https://www.hydropro-sa.com>



INFINIT BUSINESS INTELLIGENCE SOLUTIONS

Infinit is as a leading innovator in the development of safety and risk management software tailored specifically for the mining industry. Infinit's software integrates advanced analytics, real-time monitoring and comprehensive risk assessment tools, allowing users to make informed decisions and foster a culture of safety. As Infinit continues to innovate, its goal remains clear: to ensure that every mining operation prioritises the well-being of its employees through effective risk management.

 <https://infinibis.co.za>



INNOV-X AFRICA

Innov-X Africa provide a variety of solutions for the mining and exploration industries in the form of industry leading technology. The company has been the official distributor in sub-Saharan Africa for Evident/Olympus handheld XRF analysers for the past 18 years. The Vanta XRF range provides an efficient, in-field, real-time analysis of elements for mining companies with an innovative, rugged and durable handheld device. The company has branched out to include a variety of other solutions as well as partnering with Geotek and are the distributors of a variety of automated core scanning systems.



<https://www.innovxafrica.com/>



LOUIS ALLEN

Louis Allen Southern Africa provides customised management leadership training solutions based on the internationally acclaimed Allen Management System™, a system's approach to the Management Work of Planning, Organising, Leading and Controlling. Training offerings include short courses, comprehensive management leadership development programs as well as customised blended-learning development solutions specifically designed to meet the needs of individual contributors, specialists, supervisors, middle to senior management, executive leadership, and even entrepreneurs and business owners. Louis Allen has been operating and helping clients for over 65 years.



<https://www.louisallen.co.za>



MANDELA MINING PRECINCT
MINDS FOR MINES

MANDELA MINING PRECINCT

The Mandela Mining Precinct is a Public-Private Partnership between the Department of Science and Innovation (DSI) and Minerals Council South Africa. It is an initiative aimed at revitalising mining research, development and innovation in South Africa to ensure the sustainability of the industry. It has five research programmes: Longevity of Current Mines (LoCM), Mechanised Mining Systems (MMS), Advanced Orebody Knowledge (AOK), Real-Time Information Management Systems (RTIMS), and Successful Applications of Technologies Centred Around People (SATCAP).



<https://mandelaminingprecinct.org.za>



MAPTEK

At the forefront of innovative mining solutions for over 40 years, Maptek specialises in advanced software and hardware tailored for the global mining industry. Maptek's expertise spans every mining stage, from exploration to operations. State-of-the-art products include Maptek DomainMCF which uses machine learning to enable more accurate resource estimation. For slope stability monitoring, Maptek Sentry software combines with a Maptek laser scanner to monitor and report on rapid and gradual movements. Material Resource Tracking from Maptek provides accurate, real-time production performance tracking and visualisation. Maptek enables miners to make better decisions, resulting in optimal and sustainable mine sites.

 <https://www.maptek.com>



MASTER DRILLING

With new technologies such as the Mobile Tunnel Borer and the Blind Shaft Boring System, our innovative solutions and tailor-made designs coupled with a flexible support and logistics chain, make Master Drilling the preferred drilling partner throughout the lifecycle of projects from exploration to production and capital stages. To enhance this, our acquisition of Geoserve Exploration Drilling aims to provide a platform for horizontal integration in the mining industry, augmenting our expertise and global reach.

 <https://www.masterdrilling.com>



MHSC
Mine Health and Safety Council

MHSC

The Mine Health and Safety Council is funded by public revenue and is accountable to Parliament. The main task of the Council is to advise the Minister of Mineral Resources on occupational health and safety legislation and research outcomes focused on improving and promoting occupational health and safety in South African mines. The Council also oversees the activities of its committees and promotes a culture of health and safety in the mining industry.

 <https://mhsc.org.za>




micromine **MICROMINE**

Australian-founded Micromine is a provider of intuitive software solutions for the mining and exploration industry. Micromine is the only provider of solutions that are relevant to every stage of the mining process. This includes capturing, managing, visualising and understanding data to control and report on mine production. Micromine ensures that clients are able source all their software and consulting needs through local vendors with local knowledge, to provide solutions that are relevant to geographic locations and operations.

 <https://www.micromine.com>

MINTEK

Mintek is South Africa's national mineral research organisation. It is one of the world's leading technology organisations specialising in mineral processing, extractive metallurgy and related areas. We have a comprehensive range of capabilities and operations that include research, development, and innovation across the minerals value chain. We provide services in exploration, extraction, mineral processing, refining, production of metal-based products, development of processes and post-mining support. Our product line extends from end-user consumer products to physical and virtual solution-based products and services. For more information on Mintek and its activities, visit www.mintek.co.za.

 <https://mintek.co.za>



ODIN MANUFACTURING

A suite of human centric digital solutions supporting mining and manufacturing industries, improving the performance of people, machines or assets. The platform ensures paperless maintenance task management, management of unplanned incidents, live production tracking, and machine condition monitoring via AI-enabled vibration sensors.

 <https://odinmanufacturing.io>

OPTRON Group

OPTRON

Established in 1986, OPTRON, a subsidiary of the OPTRON Group, is a leading supplier of positioning solutions in partnership with Trimble, transforming operational practices across Africa. The company integrates geospatial technologies into surveying, mapping, GIS, construction, 3D modeling, land administration, mining, and environmental applications. By combining innovative hardware, software, and professional services, OPTRON addresses business challenges, providing customers with enhanced information to improve operations, reduce risks, and facilitate informed decision-making.



<https://www.optron.com>

PositioNXT

POSITIONXT

PositioNXT specialises in Distributed Fiber Optic Sensing (DFOS) technology, creating a “digital nervous system” for industries through real-time monitoring and data insights. PositioNXT systems turn fibre optic cables into continuous sensors, detecting interferences across vast distances with known location information. Proven applications include pipeline leak detection and security monitoring; real time mine-wide ventilation monitoring; tailing dam monitoring; conveyor fire prevention and condition monitoring; electrical infrastructure tampering detection; and fire prevention. This provides scalable, real-time solutions for critical industrial environments.



Contact Andre Veldsman for more information at aveldsman@positionxt.com



<https://positionxt.com>



PROBE IMT

Probe IMT's integrated offerings include operational Level 9 collision prevention systems, intelligent sensors, the integration of underground 5G network, customised safety solutions, as well as advanced air quality and gas monitoring systems. Moreover, IMT provides specialised auto-electrical and field services, Off-Highway Vehicles (OHV) and a comprehensive range of auto-electrical and Heating, Ventilation and Air Conditioning (HVAC) parts.

 <https://probeimt.co.za>



RAMJACK

Ramjack Technology Solutions is a specialised system integrator dedicated to operations technology for the mining industry in harsh, remote and challenging region. Ramjack exists to fill the gaps between original technology manufacturers and mine operations through its mandate to monitor, manage and optimise anything that matters to a mine in real-time. Ramjack specialises in applying high-performance technologies and customised services that increase productivity and improve safety performance for both surface and underground mines.

 <https://ramjacktech.com>



REUTECH

Reutech Mining, part of Reutech Group, develops innovative safety management technologies for the mining industry. Founded in 2006, it focuses on advanced geotechnical monitoring solutions to enhance real-time safety in surface and underground operations. Reutech's mission includes understanding the mining environment, offering products like the MSR range - one of the most advanced geotechnical monitoring systems. Their Sub Surface Profiler (SSP) improves decision-making and risk management with real-time data collection, featuring a lightweight, ergonomic design for challenging conditions.

 <https://www.reutechmining.com>



RIIS

RIIS is an African-focused advisory firm that has helped shape innovation ecosystem, redefine industries, and create socio-economic and commercial value. Established in 2008, with a primary focus on (but not limited to) Southern and East Africa, RIIS works at the edge of technology frontiers to build competitive companies, dynamic sectors, and healthy industrial ecosystems. RIIS specializes in industrial transformation, and sector development, including the mining sector. The company's work with individual firms includes long-term strategic planning, business analysis, technology road-mapping, organisational change, and specialised technology development.



<https://enablinginnovation.africa>



SCIAPS AFRICA

SciAps Africa is an appliance, electrical, and electronics manufacturing company that specialises in portable analytical tools that may be used anywhere in the world to measure any element. Their industry-leading X-ray fluorescence (XRF) and laser-based (LIBS) analysers are used across major industries. Given that SciAps instruments are configured to measure elements in all types of materials, the applications are constantly expanding. In recent years, these applications have included environmental toxins, agriculture, space research, and pandemic antiviral coatings.



<https://www.sciaps.com>



SML4CHANGE

SML4CHANGE

SML4change is a consulting company that offers a range of solutions to assist companies in reaching their objectives. Areas of expertise include leadership, team learning, supervisory learning, and research-based solutions. SML4change's Gallup Clifton Strengths and Strengths-Based Mentoring solutions help leaders build on their strengths and guide the organisation to success.


The company's research-based solutions include DILO and role deliverables, change management, and culture surveys.

 <https://sml4change.co.za>



SPECTROMETER

Spectrometer Technologies specialises in high-end spectrometers and analysers designed for fast and accurate elemental analysis across various sectors, including mining, precious metals, and alloys. Founded by Ingo Steinhage, the company leverages 35 years of analytical expertise to provide robust solutions that minimise analysis time. Their mission focuses on delivering reliable scientific instruments, while their vision emphasises marketing and service excellence. The company has been recognised with multiple awards for outstanding sales growth in the industry.

 <https://ustech.co.za>



SSC – LESEDI DRILLING

Lesedi Drilling as part of the SCC Group, which enhances its capabilities and resources in providing top-tier diamond-drilling services to the South African mining industry. This affiliation allows Lesedi to leverage the extensive expertise and support of the SCC Group, ensuring high standards of professionalism and competitiveness in its operations. By combining forces, they strengthen their commitment to delivering reliable core samples that are essential for mining geologists in assessing reef locations and ore quality.

 <https://www.sscgroup.co.za>



STRATIFY


Stratify is an early-stage start-up which seeks to drive awareness of fall of ground through the early identification of potential rock hazards, using the company's flagship hardware: the pioneering, hand-held device called the Seeker. This involves combining the scanning head, pod and an open-source software platform to deliver real-time 3D models. The Seeker aims to deliver fundamental outputs, including detecting installed support, measuring excavation geometry, mapping geological features, monitoring deformation, and measuring rock fragmentation post-blast.

 <https://stratify.co.za>



STS3D

Working closely with top experts in mining methods, rock engineering and safety, sts3D has racked up a track record of immersive learning simulations in the high-risk mining and metal industries. This has recently culminated in several tactile VR training solutions. These sts3D tactile VR simulators provide practical "learn-by-doing" - rapidly imparting psychomotor skills such as handling vehicle controls, advanced remote-controlled machinery, or dealing with complex bolting, support installation and drilling protocols deep underground.

 <https://sts3d.co.za>



UNITED SCIENTIFIC

United Scientific is a leading partner distributor for globally renowned manufacturers of laboratory and analytical equipment used for research and development in university laboratories and across numerous industries, including mining, industrial, chemical, and petrochemical, among many others. The company's analytical division focuses on specialised equipment for analysis, including ED-XRF Analyzers, Optical Emission Spectrometers (OES), and other advanced solutions. These cutting-edge technologies are sourced from globally recognized laboratory technology manufacturers like Hitachi, Rheotek, and others.

 <https://www.unitedscientific.co.za>



UNIVERSITY OF PRETORIA

The University of Pretoria (UP) is one of Africa's top universities and the largest contact university in South Africa. They produce socially impactful research to find solutions for the world's most pressing issues. They have a high quality of teaching and learning in the classroom, online, or in communities. We have support in place for our students to graduate on time as well-rounded, responsible citizens fully prepared for the world beyond university.

 <https://www.up.ac.za>



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science & innovation

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REPUBLIC OF SOUTH AFRICA



MINERALS COUNCIL
SOUTH AFRICA

