

# FROM THE DIRECTOR'S DESK

## Welcome to the Future: Embracing 21st Century Mining

A strong long-term trend in mining is a global 'push' for building the technology-intensive mine of the future. Interestingly, it has now become a 'pull' in the hunt for value-added technologies solving specific problems. The growing need for new skills-sets – alongside ongoing retrenchment of vulnerable occupations – is causing universities to re-think qualifications and certification. This is to make their offerings relevant and to secure placement of their graduates in a job market, which increasingly demands graduate readiness for the workplace. There is no doubt that formal learning of fundamental concepts does matter. Not everyone can go to university, and vocational learning can result in highly skilled individuals, especially when skills development combines with new forms of learning. This is a threat to the traditional university model and the WMI is working on a skills-for-jobs programme to complement formal learning – to be ready for implementation in 2020. Watch out in the next newsletter for more information on our skills acceleration programme.

### Highlights

**This is what makes the WMI different: all our researchers get the opportunity to work on real-life issues**

There were several significant WMI events during the second quarter of 2019, in addition to the regular high-profile visits to the Sibanye-Stillwater Digital Mining Laboratory (DigiMine). Most significantly, Wits hosted the company's CEO Mr Neal Froneman and the Sibanye-Stillwater International Board.

Other milestones included: the completion of the multifaceted Sterkfontein Caves safety monitoring system in partnership with Ramjack Technology Solutions; the very successful annual DigiMine seminar; attending and speaking at the 110 year celebration of the China University of Mining and Technology – our partner university in China; and two workshops on exciting applied research projects focusing on real-world problems at Gold Fields and Sibanye-Stillwater operations.

#### WMI STAFF AND STUDENTS

This newsletter recognises the achievements of WMI staff and students. The highlight in this edition is



Sibanye-Stillwater Board in 'Nick's Tunnel'

Professor Emeritus Huw (Ronald) Phillips, who graduated with the degree of Doctor of Engineering. In his thesis, he documented a lifetime of research and experience as his contribution to mine safety and health. Professor Phillips is well known for his passion for teaching, research and innovation in mining during his 25 years as the Head of Wits Mining. He is a Visiting Professor in the Wits Mining Institute where he continues to contribute in the field of mine safety and

health – passing his vast knowledge and experience over to the students. An appropriate comment made by one of the examiners for his Senior Doctorate is this: *"His research and recommendations on mine safety and health have contributed to the overall prosperity of the South African mining industry. Even more importantly, however, his legacy will be to have made coal and gold mines a safer place to work for thousands of South African miners."*



Professor Emeritus Huw Phillips

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WITS MINING INSTITUTE



**Joseph Kwiri**

Joseph Kwiri completed an MSc from the School of Mining Engineering on concept development of a smart rock engineering system for real-time decision-making and risk minimisation in deep level hard rock mines – a digital mining approach. Mr Tawanda Zvarivadza from the Wits School of Mining Engineering was the principal supervisor and Joseph was sponsored by Sibanye-Stillwater. Joseph now works for Maptek – a partner to the WMI.



**Calvin Opiti**

Calvin Opiti completed an MSc from the School of Geography on Integrated GIS and digital sensor systems for health and safety monitoring in underground mines. Professor Stefania Merlo from the School of Geography was the main supervisor of this work, with ESRI-SA the sponsor. He is currently registered for a part-time PhD qualification in the School of Geography, under the auspices of the WMI.



**Faiq Javaid**

Faiq Javaid completed an MSc from the School of Mining Engineering on Conceptualizing a Mining Information Model (MIM) using real-time information for smart decision-making – a smart economics approach. His work was supervised by me and he was sponsored by Sibanye-Stillwater.

Finally, after an almost two-year process to appoint a Head for DigiMine, it is with great pleasure to announce that Mr Ahsan Mahboob accepted the offer. He holds a Masters degree in Remote Sensing and Geographical Information Systems and is at an advanced stage of submitting his PhD thesis at the School of Mining Engineering. During his professional career as a lecturer in geospatial technologies, he carried out projects for government and industry organisations. His personal research interests include satellite technologies, unmanned aerial vehicles (UAVs), remote sensing, GIS, smart mineral explorations, data science, artificial intelligence and cyber-physical spatial data modelling. Under his leadership, DigiMine will initiate several new projects, starting with the integration of technologies for smart, secure and sustainable mining – for decision-making from a control room environment.



**Sibanye-Stillwater DigiMine  
new head, Mr Ahsan Mahboob**

Until next time, let us spread the good news that 21st century mining is moving from smart and intelligent to be responsible, safe and efficient. This is exciting!

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