



The Ninth International Conference on Deep and High Stress Mining (Deep Mining 2019) was held at the Misty Hills Conference Centre, Muldersdrift, Johannesburg from 24 to 26 June 2019. Conferences in this series have previously been hosted in Australia, South Africa, Canada, and Chile. This event, jointly organized by the South African National Institute of Rock Engineering (SANIRE), the Australian Centre for Geomechanics (ACG), and the Southern African Institute of Mining and Metallurgy (SAIMM), was attended by 196 delegates from 19 different countries. Most of the delegates were from Africa (146), but the other continents were well represented; Asia (6), Australasia (12), Europe (22), North America (5), and South America (5).

The Deep Mining series of conferences continues to contribute to our understanding of deep, high-stress mines. Around the world mines are getting deeper and the challenges of stress damage, squeezing ground, and rockbursts are ever-present and increasing. Mining methods and support systems have evolved slowly to improve the management of excavation damage and safety of personnel, but damage still occurs and personnel are injured. Techniques for modelling and monitoring have been adapted and enhanced to help understand rock mass behaviour under high stress. Many efficacious and dynamic support products have been developed, but our understanding of the demand and capacity of support systems remains uncertain. During the conference, 33 papers were presented addressing these topics, 11 of which have been selected for this Deep Mining edition of the SAIMM Journal.

Hagan *et al.* describe testing of rockbolts in full-scale laboratory conditions. This comprehensive approach includes both shear and pull testing, taking the mechanical properties of the rock mass into consideration. Crompton and Sheppard provide some practical insights into the design of resin-anchored tendons, optimizing resin mixing and the resin annulus. A new remote, mechanized bolting system for use in narrow reefs is described by O'Connor and Seritic, which could significantly improve the safety of underground workers. Limitations of South African narrow tabular deep mine layout design criteria are explained by Malan and Jooste and they discuss possible improvements by calibrating with stress measurements and rock mass monitoring. The evolution of mechanized mining and support methods for the wide reefs at South Deep gold mine is presented by Andrews, Butcher, and Ekkerd. Bouzeran *et al.* describe analyses of rock mass heterogeneity and buckling around excavations, which helps to understand stope drift stability in foliated ground under high stress conditions. Sharrock and Chapula provide a different perspective on similar challenges at CSA Mine, Cobar. Wesseloo presents some insights into seismic hazard and proposes a consistent terminology to avoid miscommunication. The influence of stopes on the seismic source is explored by Linzer *et al.* Jones *et al.* describe how underground stope surveys using autonomous drone systems can assist with the understanding of rock mass behaviour and failure mechanisms, which can in turn improve mine planning and design. An approach to big data analytics and artificial intelligence in rock mechanics is presented by McGaughey; this topic is becoming more important as greater quantities geotechnical and monitoring data are collected.

We are grateful to the presenters and delegates for taking time out of their busy schedules to come and share their knowledge and expertise at Deep Mining 2019. The sponsors are also thanked for their generous contributions, as are the organizing committee and technical reviewers. As always, we appreciate the dedication and organizational skills of the SAIMM secretariat.

W.C. Joughin