

# 5TH YOUNG PROFESSIONALS ONLINE CONFERENCE

A SHOWCASE OF EMERGING RESEARCH AND INNOVATION IN THE MINERALS INDUSTRY

20-22 SEPTEMBER 2021

## Preliminary Programme

### Day 1 — Monday 20 September 2021

- 09:00–09:30 **Zoom Login**  
09:30–09:40 **Zoom logistics**, SAIMM  
09:40–09:50 **Welcome and Opening Address**  
T.M. Mmola, Chairperson, *Young Professionals Conference*  
09:50–10:00 **SAIMM Opening Address**  
I.J. Geldenhuys, *President, SAIMM*

#### Session 1:

##### Session chairperson —

- 10:00–10:30 **Keynote Address— TBC**  
M. Ally, *Minerals Council of South Africa, South Africa*  
10:30–10:40 **The SAMCODES – a vital code of practise for geoscientists**  
S.M. Rupprecht, *SSC President, South Africa*  
10:40–10:55 **The evaluation of sintering as a cause of duct blockage in a submerged arc furnace in silicomanganese production**  
M.B. Sitefane<sup>1</sup>, J.D. Steenkamp<sup>1,2</sup>, and P. den Hoed<sup>2</sup>, <sup>1</sup>*Mintek* and <sup>2</sup>*University of the Witwatersrand, South Africa*  
10:55–11:10 **Characterization of a rehabilitated gold mine dump with respect to potentially hazardous radioactive elements**  
S. Mxinwa, G. Freemantle, L. Landu, O. Bazhko, and E.D. Deenanath, *Mintek, South Africa*  
11:10–11:25 **Q&A**  
11:25–11:40 **Morning Break**  
11:40–11:55 **Validation of a new density measurement technology**  
M. Nelwamondo and S. Naik, *Anglo American, South Africa*

#### Session 2

##### Session chairperson —

- 11:55–12:10 **Optimization of acid-in-agglomeration dosage and curing during percolation leaching of a west African uranium ore**  
E.D. Deenanath and P. Basson, *Mintek, South Africa*  
12:10–12:25 **Development of an alkaline percolation leaching process for the treatment of an arsenopyrite refractory gold ore Part I: Agglomeration**  
M. Ndhlalose, D.N. Nxumalo, and P. Basson, *Mintek South Africa*  
12:25–12:40 **From Taylorism to safety culture and beyond: A review of orthodox and contemporary occupational health and safety management within a South Africa context**  
M. Goncalves, *Health and Safety Dialogue Company Ltd, South Africa*  
12:40–12:55 **Impact breakage devices - the future of comminution technology?**  
J.S. Theron and S. Naik, *Anglo American Technical Solutions, South Africa*  
12:55–13:10 **Q&A**  
13:10–13:30 **Lunch**

#### Session 3

##### Session chairperson —

- 13:30–13:45 **Corrosion classification method/s applicable to South African deep level underground mining environment: Ultra-deep level gold mine case study**  
D. Rachidi and R. Mitra, *University of the Witwatersrand, South Africa*  
13:45–14:00 **Geo-mechanical influences on dilution and draw control in block caving**  
T. Kefalotse, *Aqualogic (Pty) Ltd, South Africa*  
14:00–14:15 **The assessment of absenteeism: A case study of a platinum mine**  
N.M. Chiloane and M. Mpanza, *University of Johannesburg, South Africa*  
14:15–14:30 **Mineral resource optimization by monitoring the DMS discard qualities**  
S.S. Mpofu, *Exxaro, South Africa*  
14:30–14:45 **Exploring the potential use of fibre-rich plants to create post-mining industrial development**  
T. Chimbganda<sup>1</sup>, J.L. Broadhurst<sup>1</sup>, and G. Hangone<sup>2</sup>, <sup>1</sup>*University of Cape Town* and <sup>2</sup>*Cape Peninsula University of Technology, South Africa*  
14:45–15:00 **Q&A**  
15:00 **Close of Conference Day 1**

### Day 2 — Tuesday 21 September 2021

- 09:00–09:30 **Zoom Login**  
09:00–09:40 **Zoom logistics**, SAIMM  
09:40–09:50 **Welcome and Opening Address**  
T.M. Mmola, Chairperson, *Young Professionals Conference*  
09:50–10:00 **Global Engineering Symposium Address**  
K. Rathobei and N. Monei, *Nala Consultancy & Projects*

#### Session 4

##### Session chairperson —

- 10:00–10:30 **Keynote Address— TBC**  
A. van Zyl, *SRK, South Africa*  
10:30–10:45 **Has South Africa done enough to encourage junior mining and to establish something resembling a junior mining sector?**  
G.T. Malesa, *Fasken, South Africa*  
10:45–11:00 **Blending decision considerations for low grade gold ores in heap leach operation and its impact on the overall objective of the project: A case study of Ruia Mine Zimbabwe**  
T. Chinhengo and T.E. Leboho, *Golden Reef Mining P/L, Zimbabwe*  
11:00–11:15 **The application of micro hydropower technology on Matla's water reticulation system**  
M. Ngobeni, *Exxaro, South Africa*  
11:15–11:30 **Q&A**  
11:30–11:40 **Morning Break**

#### Session 5

##### Session chairperson —

- 11:40–11:55 **The study of factors influencing mining engineering as a career choice**  
N.M. Chiloane, *University of Johannesburg, South Africa*  
11:55–12:10 **Developing a concept that can be used to quantify the motion of flyrock, with the intention of eventually producing a measuring tool for future flyrock research**  
J. van der Walt and W. Spiteri, *University of Pretoria, South Africa*  
12:10–12:25 **A comparison of real options and discounted cash flow valuation techniques on a gold mining project**  
A.P. Shivute<sup>1</sup> and T. Tholana<sup>2</sup>, <sup>1</sup>*University of Namibia, Namibia* and <sup>2</sup>*University of the Witwatersrand, South Africa*  
12:25–12:40 **Improved recovery of gold encapsulated in pyrite mineral using flotation process**  
S. Nhlapo, E. Makhatha, and S.S. Lephuting, *University of Johannesburg, South Africa*  
12:40–12:55 **Mechanical properties of Grade 5 Ti6Al4V versus Grade 23 Ti6Al4V for Wire Arc Additive Manufacturing (WAAM)**  
L.M. Mashigo, H. Moller, C. Gassmann, *University of Pretoria and GEFERTEC GmbH*  
12:55 – 13:10 **Q&A**  
13:10–13:30 **Lunch**  
13:30–13:45 **Beneficiation of recycled process water at DRDGOLD's ERGO plant and evaluating its effect on gold recovery**  
A. Narain, *University of the Witwatersrand, South Africa*  
13:45–14:00 **Material characteristics of additively manufactured Ti-6Al-4V samples using the laser based direct energy deposition technique**  
M.G. Willemse, C. Siyasiya, N.K.K. Arthur, D. Marais, A.M. Venter, *University of Pretoria, CSIR and Necsa, South Africa*  
14:00–14:15 **Unweaving the multiple-point simulations: an application to ore bodies**  
A. Nóbrega de Ávila, *Instituto Federal do Espírito Santo, Brazil*  
14:15–14:30 **Performance recognition of column flotation process using K- means clustering algorithm based on froth image analysis**  
F. Nakhaei, *North-West University, South Africa*  
14:30–14:45 **Preliminary study of the pre-reduction and smelting of carbon-based titaniferous magnetite pellets**  
S. Ngoepe, N. Mafeje, P. Maphutha, and X. Goso, *Mintek, South Africa*  
14:45 – 15:00 **Impact of Covid-19 on the South African Mining Industry**  
D. Rachidi<sup>1</sup> and T. Mkhize<sup>2</sup>, <sup>1</sup>*Ukwazi Mining Studies* and <sup>2</sup>*University of South Africa, South Africa*  
15:00–15:15 **Q&A**  
15:15 **Close of Conference Day 2**

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## Preliminary Programme

### Day 3 — Wednesday 22 September 2021

- 09:00–09:30 **Zoom Login**  
09:30–09:40 **Zoom logistics, SAIMM**  
09:40–09:50 **Welcome and Opening Address**  
T.M. Mmola, Chairperson, *Young Professionals Conference*

#### Session 6: Session chairperson —

- 09:50–10:20 **Keynote Address— TBC**  
T. Dywili, *Lilitha Group, South Africa*
- 10:20–10:35 **The rebellion of artisanal and small-scale mining: Challenging issues of informality with informal resolve**  
O.P. Koatlhai, *University of the Witwatersrand, South Africa*
- 10:35–10:50 **The investigation of the link between human reliability a mine productivity**  
P. Muguza, M. Mpanza, *University of Johannesburg, South Africa*
- 10:50–11:05 **Iron ore pre-concentration using the hydrofloat® at the Minas-Rio Complex in Brazil**  
T. Malinga, *Anglo American, South Africa*
- 11:05–11:20 **Identify and evaluate critical disruptive technologies with the potential to simplify the complexity of the mining ecosystem**  
K. Philo and R.C.W. Webber-Youngman, *University of Pretoria, South Africa*
- 11:20–11:35 **Q&A**
- 11:35–11:50 **Morning Break**
- 11:50–12:05 **Geochemical Assessment of an Underground Coal Gasification Geo-reactor**  
L. Mokhahlane, *University of the Witwatersrand, South Africa*

#### Session 7 Session chairperson —

- 12:05–12:20 **Health-care support for employees and local communities by mining companies during Covid-19 pandemic, with potential for alignment to local government (Integrated Development Plans)**  
T. Chabalala, *University of the Witwatersrand, South Africa*

- 12:20–12:35 **PICA 2.0 - Fully automated quality control**  
B. Coetzee, Exxaro, *South Africa*
- 12:35–12:50 **An investigation into the possible use of an old-age rotary kiln for the novel PREMA project**  
M.B. Sitefane, J.D. Steenkamp, *Mintek, South Africa*
- 12:50–13:05 **Demonstration of experimental methods for determination of thermo-physical properties of molten salt mixtures**  
L. Malaka, I. Thobadi, M.M. Ramakokovhu, R. Maphanga, and L. Moropeng, *Mintek, Tshwane University of Technology, and Council for Science and Industrial Research, South Africa*
- 13:05–13:20 **Q&A**
- 13:20–13:40 **Lunch**
- 13:40–13:55 **Valorisation of electric arc furnace dust using hybrid sulphation roasting and leaching process**  
P. Sithole, E. Matinde, and S. Ndlovu, *Mintek and University of Witwatersrand, South Africa*
- 13:55–14:10 **Data science applied to Silicomanganese plant data to identify valuable relationships**  
B. Hattingh, P. van Vuuren, A. Alberts, J.D. Steenkamp, and Q. Reynolds, *Mintek, North-West University, University of the Witwatersrand, and Stellenbosch University, South Africa*
- 14:10–14:25 **Converting ball-mills in sabc circuits to composite mills**  
S. Nkwanyana, I. Govender, and B. Loveday, *University of KwaZulu-Natal and Mintek, South Africa*
- 14:25–14:40 **A review on the implications of electricity cost on the mining industry**  
N.D. Simelane and M. Mpanza, *University of Johannesburg, South Africa*
- 14:40–14:55 **Post-processing of multiple-point simulations using information entropy as an uncertainty measuring tool**  
A. Nóbrega de Ávila, *Instituto Federal do Espírito Santo, Brazil*
- 14:55–15:10 **Q&A**
- 15:10 **Close of Conference**