

The Southern African Institute of Mining and Metallurgy in collaboration with the Zululand Branch are organising:

# HMC2023

TWELFTH INTERNATIONAL HEAVY MINERALS CONFERENCE

**21-22 AUGUST 2023**  
THE CAPITAL ZIMBALI, BALLITO,  
KWAZULU-NATAL

He  
B C N O F Ne  
Al Si P S Cl Ar  
V Cr Mn Fe Co Ni Cu Zn Ga Ge As Se Br Kr  
Nb Mo Tc Ru Rh Pd Ag Cd In Sn Sb Te I Xe  
Ta W Re Os Ir Pt Au Hg Tl Pb Bi Po At Rn  
Db Sg Bh Hs Mt Ds Rg Cn Nh Fl Mc Lv Ts Og



## PRELIMINARY PROGRAMME

### Sunday, 20 August 2023

17:00-20:00 **Welcome Networking Cocktail and Early Registrations**  
Venue: Exhibition Hall - Aloe  
Dress Code: Smart Casual

### Conference Day 1 – Monday, 21 August 2023

08:00-08:30 **Registration Opens and Early Morning Refreshments**

08:30-08:40 **Welcome and Opening Address**  
J. Selby, *Conference Chairperson*

08:40-08:45 **Safety Briefing**

08:45-09:00 **SAIMM Presidential Address**  
Z. Botha, *SAIMM, South Africa*

09:00-09:10 **Sponsor Presentation: Mineral Technologies**



#### Session 1: Energy and Climate Change

09:10-09:40 **Keynote Address: The mining industry and the energy crisis – what is the role we are playing?**  
Z. Botha, *SAIMM, South Africa*

09:40-10:00 **Rio Tinto iron and titanium decarbonisation strategy**  
S.L. Fortin, D. Ferguson, *Rio Tinto, South Africa*

10:00-10:20 **Assessment of energy consumption in heavy minerals sand mining and processing plant**  
M. Laghaei, N. Haque, W. Bruckard, M.I. Pownceby, and H. Masoumi, *Monash University, CSIRO Mineral Resources, Australia*

10:20-10:30 **Sponsor Presentation: HATCH**  
**HATCH**

10:30-10:50 **Mid-Morning Refreshments**

#### Session 2: Pyrometallurgy and Smelting

10:50-11:10 **Investigation into solid-state reduction of ilmenite micro-pellets in C-CO-H<sub>2</sub> system**  
X.C. Goso, K. Bisaka, K. Maluleke, B. Xakalashé, and E. Matinde, *Mintek, Zawadi Business Solutions Pty Ltd, South Africa*

11:10-11:30

**Process simulation of carbonitrothermic synthesis of Titanium Nitride from ilmenite**  
R.J. Motsoeri, *University of Johannesburg, South Africa*

11:30-11:50

**Thermal efficiency of an ilmenite smelting furnace**  
H. Kotze, *Tronox Mineral Sands, South Africa*

11:50-12:10

**Furnace refractories: monitoring of remaining lining thickness and moisture content with saveway optisave & savedry**  
D. Zeelie, *Saveway, South Africa*

12:10-13:10

**Lunch**

#### Session 3: Processing

13:10-13:40

**Keynote Address: Shifting Sands - The changing world of titanium supply**  
D. McCoy, *TZMI, Australia*

13:40-14:00

**Debottlenecking, a value driven approach**  
D. Nel, B. Moolman, *Hatch, South Africa*

14:00-14:20

**Interactions between feed and high-titania slag - Mechanisms and influence on process dynamics**  
J.J. Swanepoel, J.H. Zietsman, *Ex Mente Technologies, South Africa*

14:20-14:40

**High-Capacity Spirals: To Use or Not to Use?**  
J. Agenbag, *Mineral Technologies, South Africa*

14:40-15:00

**High Tension Roll (HTR) technology comparison**  
R. Kiakuvue, *LightDeepEarth, South Africa*

15:00-15:20

**Afternoon Refreshments**

#### Session 4: Operations and Water Treatments

15:20-15:40

**Acquisition of second dredge at QMM**  
P. Nirintso, *Rio Tinto, Madagascar*

15:40-16:00

**Overview of the technology (ies) for waste mine water treatment for recycle or re-use at ultra-high water recovery**  
M. Kgaria and C. Spagnuolo, *Multotec, South Africa*

#### Session 5: Poster Session

16:00-16:05

**Application of RED technology for TiFe-oxide removal**  
E. Tjatji, *LightDeepEarth, South Africa*

16:05-16:10

**Impact of rutile particle quality in wet separation circuits**  
C. Maifo, *LightDeepEarth, South Africa*

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## PRELIMINARY PROGRAMME

- 16:10-16:15 **Trash mineral rejection – the hard and soft approach – you need both**  
K. Khaole, *LightDeepEarth, South Africa*
- 16:15-16:20 **Slimes behaviour characterization – the underdog that can bite**  
M. Mudila, *LightDeepEarth, South Africa*
- 16:20-16:25 **Altered ilmenite – not all ilmenites are created equal**  
G. Ntoyi, *LightDeepEarth, South Africa*
- 16:25-16:30 **Selective fragmentation to improve ilmenite product yield**  
S. Mlondo, *LightDeepEarth, South Africa*
- 16:30 **End of conference day one**
- 16:30-18:00 **Time at Leisure**
- 18:30-20:30 **Conference Dinner**  
Delegates to meet at the hotel main reception @18:00 for departure to the dinner venue  
Dress code: Smart Casual

### Conference Day 2 – Tuesday, 22 August 2023

- 08:00-08:30 **Registration Opens and Early Morning Refreshments**
- 08:30-08:40 **Welcome and Opening Address**  
J. Selby, *Conference Chairperson*
- 08:40-08:45 **Safety Briefing**
- 08:45-08:55 **Sponsor Presentation: Rio Tinto | Richards Bay Minerals**



#### Session 6: Processing (continued)

- 08:55-09:25 **Keynote Address: Projections of future climate change impacts in Southern Africa**  
F.A. Engelbrecht, *University of the Witwatersrand, South Africa*
- 09:25-09:45 **Recent advances in gravity concentration of mineral sands**  
F. Bornman, *Multotec, South Africa*
- 09:45-10:05 **A dry process for upgrading chromite sand concentration plant tailings to foundry sand specifications**  
E. de Witt, R.M. Flanagan, and V. Diaz Endeco, *Magquip (Pty) Ltd, Omega (Pty) Ltd, South Africa*
- 10:05-10:25 **Flowsheet development for the production of rutile and garnet from a hard rock eclogite deposit in Norway**  
C. Swart, D. Nel, V. Gopalakrishnan, and S. Kleppe, *Hatch, South Africa*

- 10:25-10:35 **Sponsor Presentation: IHC Mining**



- 10:35-10:55 **Mid-morning Refreshments**

#### Session 7: Processing (Continued)

- 10:55-11:15 **Particle coating characterisation and associated process response**  
M. Gerber, *LightDeepEarth, South Africa*
- 11:15-11:35 **Upgrading of titaniferous slag to suitable titania feedstock using a roast-leach process**  
S. Nkosi, X.C. Goso, T. Mokone, and J. Petersen, *Mintek, University of Pretoria, South Africa*
- 11:35-1:55 **KMML at a glance**  
KMML, *India*
- 11:55-12:15 **Rio Tinto QMM magnetic rejects recovery**  
B. Maroandro, *Rio Tinto, Madagascar*
- 12:15-12:35 **Evolution of the 117hm as a spiral of choice for high recovery of mineral sands in low grade feed**  
M. Xulu, *Multotec, South Africa*
- 12:35-12:55 **Head analyses resolution to predict final product quality and recovery?**  
K. van der Merwe, *LightDeepEarth, South Africa*
- 12:55-13:55 **Lunch**

#### Session 8: Geology and Mineralogy

- 13:55-14:25 **Keynote Address: Assessment of heavy minerals concentration pattern along the South East Coast of India for industrial applications**  
D. Singh, *IREL (India) Limited, India*
- 14:25-14:45 **Variability of Pd distribution in chromitite and pegmatoid layers at the Eastern limb of the Bushveld Igneous Complex and related value recovery processing challenges**  
M. Nkhumeleni and A. F. Mulaba-Bafubiandi, *University of Johannesburg, University of South Africa, South Africa*
- 14:45-15:05 **Ilmenite in apatite-oxide rich rocks in the Bushveld Complex: Potential, non-conventional source of titanium, Mineralogy**  
H. Mandende and T. Mothupi, *Council for Geoscience, University of the Witwatersrand, South Africa*
- 15:05-15:30 **End of technical programme and Afternoon Refreshments**