Sunday April 26th

17.00-19.00  Registration and wine reception, with hot and cold canapés (accompanying persons welcome)

Monday April 27th

08.00  Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice

08.45  Opening remarks
B.A. Wills (MEI, UK)

09.00  Technical Session 1
Chairmen: TBA

09.00  Keynote Lecture: The slow journey to practical energy efficient comminution
C. Rule (Independent Metallurgical Consultant (Seymet Pty Ltd, South Africa)

09.30  Keynote Lecture: Comminution energy: how much is a lot?
M. Daniel (CMD Consulting Pty Ltd, Australia)

10.00  Coffee and exhibit viewing

10.45  A new general formula to predict the specific energy of comminution
R. Valle Peche (Metso, Peru)

11.00  Predicting specific energy requirements for unusual ores
G.R. Ballantyne (Ausenco and JKMRC, Australia), M. Pyle, R. Chandramohan, B. Foggiaatto and G. Lane (Ausenco, Australia)

11.15  Energy savings in microwave-assisted comminution: fact or fiction?
E.R. Bobicki, D. Boucher, J. Forster (University of Toronto, Canada), C. Pickles and A. Olmsted (Queen’s University, Canada)
A detailed study of the energy utilisation in a drop-weight tester
N. Chimwani (University of South Africa Florida Campus, South Africa) and M. Bwalya (University of Witwatersrand, South Africa)

Micromechanical modelling of manganese containing slag comminution in the design of energy efficient secondary raw material beneficiation processes
M. Lindroos, T. Andersson, A. Laukkanen (VTT Materials and Manufacturing, Finland), L. Suarez, J. Kajberg, P. Jonsén (Luleå University of Technology, Sweden), J. Terva and Marke Kallio (Metso Minerals, Finland)

Increased energy efficiency achieved at Ernest Henry through the transition to inert grinding media
C.J Greet (Magotteaux Pty Ltd, Australia) and G. Ballantyne (JKMRC, Australia)

Predicting the grinding energy of VRM depending on material characterization
D. Altun, H. Benzer (Hacetette University, Turkey) and C. Gerold (Loesche GmbH, Germany)

Simulation of surface damage and body breakage in milling
M. Sousani, A. Chagas, C.B. Padros, A. Saxena and Y. Yang (DEM Solutions Ltd, UK)

Rocky DEM Improvements to breakage model
L. Tavares (Federal University of Rio de Janeiro, Brazil), C. Maliska and A. Potapov (ESSS Rocky DEM, USA)

Influence of sampling techniques on the creation of microfractures in rock particles
L. Guldris, E. Hulthen, J. Malmqvist (Chalmers University of Technology, Sweden) and J. Hogmalm (University of Gothenburg, Sweden)

The Geomtest breakage test
M. de Paiva Bueno, T.C. Matus, J. Torvela, T. Liedes and S. Luukkanen (Oulu Mining School, Finland)

Investigations on the hardness of dolomite
T. Mütze (TU Bergakademie Freiberg, Germany), T. Fraszczak and O. Ortlepp (Wünschendorfer Dolomitwerk GmbH, Germany)

Study of breakage behaviour on SiFeMn slags
C. Carvajal, O. Popov, V. Shkolin and H. Lieberwirth (Technische Universität Bergakademie Freiberg, Germany)

Grindability of carbonate rocks for agricultural acid soil management: a case study on Minare and Moga rock resources in Ethiopia
T. Chernet and T. Korhonen (Geological Survey of Finland, Finland)

Ore texture crack formation and liberation by quantitative characterization of spatial deformation
P.S. Parapari, M. Parian and J. Rosenkranz (Luleå University of Technology, Sweden)

Exploring the non-linear population balance model using attainable region theory
D. Zimucha, D. Ming (University of the Witwatersrand, South Africa), N. Chimwani and D. Hildebrandt (University of South Africa, South Africa)

Selective comminution through precise impact breakage and controlled abrasion
B.S. Agbenuvor, A. Septian, C. Antonio, V. Jokovic (JKMRC, Australia) and R. Morrison (CRC ORE, Australia)

A study on mineral breakage and liberation characteristics of a microwave-irradiated gold-copper ore
I.B. Fernandes, M.A. Reuter (Helmholtz Institute Freiberg for Resource Technology and Technical University Bergakademie Freiberg, Germany), A. Hassanzadeh, M. Rudolph (Helmholtz Institute Freiberg for Resource Technology, Germany), T. Mütze (Technical University Bergakademie Freiberg, Germany), D.H. Hoang (Helmholtz Institute Freiberg for Resource Technology and Technical University Bergakademie Freiberg, Germany) and T. Leißner (Technical University Bergakademie Freiberg, Germany)

Single and multiple breakage events in fine particle breakage testing with a two-roll mill
A.-C. Böttcher, G. Fragnière, C. Thon, C. Schilde and A. Kwade (Technische Universität Braunschweig, Germany)

Sundowner in Vineyard Gardens

Accompanying guests welcome
08.15 Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice

09.00 Technical Session 3
Chairmen: TBA

09.00 Mechanical characterization and modelling of heterogeneous brittle materials for large-scale crushing processes
L. Suarez, J. Kajberg, S. Larsson, P. Jonsén (Luleå University of Technology, Sweden), A. Laukkanen, M. Lindroos and T. Andersson (VTT Technical Research Centre of Finland Ltd, Finland)

09.15 Utilization of environmental impact simulations in crushing plant design and operation
P. Papadopoulou, G. Asbjörnsson, E. Hulthén and M. Evertsson (Chalmers University of Technology, Sweden)

09.30 Increasing mill throughput by installation of a new powerful CH550 cone crusher - plant practice
A.L. Ramos (Sandvik Espanola AB, Spain), M. Johansson and H.-R. Manouchehri (Sandvik SRP AB, Sweden)

09.45 Implementation of optimization methods in crushing plants
K. Bhadani, G. Asbjörnsson, E. Hulthén and M. Evertsson (Chalmers University of Technology, Sweden)

10.00 Plant design and operation for robust performance of crushing circuits
M. Johansson and M. Evertsson (Chalmers University of Technology, Sweden)

10.15 Coffee

11.00 Fit-for-purpose VSI modelling framework for process simulation
S. Grunditz, G. Asbjörnsson, E. Hulthén and M. Evertsson (Chalmers University of Technology, Sweden)

11.15 Sustainable comminution by VeRo Liberator® for low-energy, dry, high-liberation breakage
G. Borg (PMS GmbH and Martin Luther University Halle-Wittenberg, Germany), O. Scharfe and F. Scharfe (Martin Luther University Halle-Wittenberg, Germany)

11.30 Application of the VeRo Liberator® on a nickel laterite slag
D. Alexander, T. Chenje and S. Naik (Anglo American, UK)

11.45 Selective comminution of a complex skarn ore
H. Lieberwirth and S. Lange (TU Bergakademie Freiberg, Germany)

12.00 Modelling the rotary offset crusher
T. Nghipulile, M. Bwalya, M. Moys and H. Simonsen (University of the Witwatersrand, South Africa)

12.15 Simulation of compression and impact crushers using the discrete element method
L.M. Tavares, V.A. Rodriguez, A. Tino and F.P. André (Universidade Federal do Rio de Janeiro, Brazil)

12.30 Continuous treatment of materials by electrical impulses
M. Mezzetti, H. Lieberwirth (Technische Universität Bergakademie Freiberg, Germany), E. Anders (Technische Universität Dresden, Germany), S. Weyrauch (Haver Engineering GmbH, Germany), A. Lienert (Thomas Werner Industrielle Elektronik e. Kfm., Germany) and F. Haubrich (G.E.O.S. Ingenieurgesellschaft mbH, Germany)

12.45 Lunch

14.00 Technical Session 4
Chairmen: TBA

14.00 HPGR for lower capacity projects
G. van Wyk and W. Barkhuizen (thyssenkrupp Industrial Solutions, South Africa)

14.15 The benefit of selective grinding by HPGR in air separation process
H. Lieberwirth, R. Kühnel (TU Bergakademie Freiberg, Germany), M. Pfeifer and F. Heinicke (Köppern Aufbereitungstechnik GmbH & Co.KG, Germany)

14.30 A methodology to predict the HPGR operational gap by using piston press tests
G. Pampanara and B. Klein (University of British Columbia, Canada)

15.00 Polycom HPGR – poised to evolve from revolution to disruptive innovation in mineral processing
E. Burchardt, T. Mackert, G. Sauermann and G. van Wyk (thyssenkrupp Industrial Solutions, South Africa)
Operational considerations for hybrid SAG-HPGR comminution circuits
R. Chandramohan (Ausenco, Canada), G. Lane and C. Morley (Ausenco, Australia)

T80 – the key to best practice comminution
J. Starkey (Starkey & Associates, Canada)

Merits of converting S1 and S2 SAG mills discharge liners at Kansanshi Mine from radial to spiral design
K. Ngosa, M. Phiri, C. Chongo, B. Mwashi (First Quantum Minerals, Zambia) and D. Phiri (Bradken, South Africa)

Coffee

Merits of converting S1 and S2 SAG mills discharge liners at Kansanshi Mine from radial to spiral design
K. Ngosa, M. Phiri, C. Chongo, B. Mwashi (First Quantum Minerals, Zambia) and D. Phiri (Bradken, South Africa)

Coaches leave for conference dinner at Kirstenbosch Botanical Gardens (ticketed)

Wednesday April 29th

08.15 Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice

09.00 Technical Session 5
Chairmen: TBA

09.00 Isolating the impact of pebble recycling on AG/SAG circuit: a data-driven method
H. Li, M. Lindqvist (FLSmidth A/S, Denmark), M. Evertsson, E. Hulthen and G. Asbjörnsson (Chalmers University of Technology, Sweden)

09.15 Optimization of discharge flow efficiency in a SAG mill
A. Saxena, R. Yang and N. Hubbard (ME Elecmetal, USA)

09.30 The effect of inner lifter bars on an AG mill discharge system using Coupled DEM SPH simulations
V. Murariu (Metso Minerals Inc., USA)

09.45 A complete particle scale model of charge and slurry behaviour in SAG mills including coarse particle breakage and slurry phase grinding
P. W. Cleary, G. W. Delaney, M. D. Sinnott (CSIRO Data61, Australia) and R. D. Morrison (JKMRC, Australia)

10.00 Advances on mechanistic modeling of SAG mills
R. M. de Carvalho and L. M. Tavares (Universidade Federal do Rio de Janeiro, Brazil)

10.15 Characterisation of metal debris in grinding circuits
R. K. Asamoah, W. Skinner (University of South Australia, Australia) and C. J. Greet (Magotteaux Pty Ltd, Australia)

10.30 Coffee

11.15 The effect of particle shape in mills using polyhedral particles on the GPU
N. Govender (Modelez R&D, UK), R. Rajamani (University of Utah, USA), P. W. Cleary (CSIRO, Australia) and D. N. Wilke (University of Pretoria, South Africa)

11.30 Automated mill relining: the journey towards 24 hour relines
D. Brander, J. Bohorquez and S. Gwynn-Jones (Russell Mineral Equipment, Australia)

11.45 Liner optimization of Ahafo mine ball mill
R. Rajamani (University of Utah, USA), P. Kumar (Polycorp Ltd, Canada), T. Bhattacharjii (Polycorp Ltd, South Africa), N. Govender (Mondelez Co., UK), T. Abuah, D. Egya-Mensah and E. Asakpo (Newmont Gold Corp Ahafo Mine, Ghana)

12.00 Impact of increasing ball mill speed on the overall oxide circuit performance at Kansanshi Mine
K. Ngosa, M. Phiri, C. Chongo and K. Ngosa (First Quantum Minerals, Kansanshi Mine Plc, Zambia)

12.15 A comparative study of the grate vs overflow ball mill discharge configurations – pilot scale
A. N. Mwale, A. N. Mainza (University of Cape Town, South Africa), Y. Hanuman (University of Cape Town and Anglo American Platinum, South Africa) and M. Van der Heever (Magotteaux International, South Africa)

12.30 Energetic assessment of the ball mill using the Discrete Element Method - Part 1: Calibration of the DEM simulations using the concepts of Toe and Shouldler of the charge
K. P. Simba, C. Bhondayi and D. Hildebrandt (University of South Africa, South Africa)

12.45 Lunch
14.00  **Technical Session 6**  
Chairmen: TBA

14.00  **Coupled DEM+SPH prediction of charge and slurry mixing and transport in an overflow ball mill**  
P.W. Cleary, M.D. Sinnott (CSIRO Data61, Australia) and R.D. Morrison (JKMRC, Australia)

14.15  **Prediction of charge dynamics and slurry transport in tumbling mill using two-way coupled CFD-DEM model**  
K. Mayank, A. Mittal, M. Narasimha (Indian Institute of Technology, India), I. Govender (University of Kwazulu-Natal, South Africa) and A.N. Mainza (University of Cape Town, South Africa)

14.30  **Improving closed grinding circuit capacity and efficiency by revisiting the basics of grinding**  
B. Zhang, A. Jain and S.B. Valine (Derrick Corporation, USA)

14.45  **Investigating the effect of the feeding arrangement to screen media wear and screening efficiency by using DEM**  
A. Davoodi, G. Asbjörnsson, E. Hultén and C.M. Evertsson (Chalmers University of Technology, Sweden)

15.00  **The effect of classification efficiency on the mineral liberation properties of a polymetallic ore**  
J.J. Frausto (JKMRC, Australia and Metso Minerals, Canada), G.R. Ballantyne (JKMRC and Ausenco, Australia), K. Runge, M.S. Powell, E.M. Wightman, C.L. Evans (JKMRC, Australia), A. Nunez, R. Cruz, S. Gomez (Fresnillo PLC, Mexico) and P. Gonzalez (Centro de Investigación y Desarrollo Tecnológico, Mexico)

14.15  **Coffee**

16.00  **Optimizing grind of closed dry grinding and classification circuit treating iron ore fines suitable for pellet grade with the aid of simulations**  
N.P. Virendra, M. Narasimha (Indian Institute of Technology, India), K. Bhanu Venatesh and D. Srinivas (Tata Steel R&D, India)

16.15  **An investigation into grinding characteristics at the Boliden Aitik mine**  
A. McElroy (Boliden Mineral, Sweden), M. Linna, A. Johansson, A. Isaksson, P. Karlsson (Boliden Aitik, Sweden) and S. Markström (Markmin, Sweden)

16.30  **The importance of mill electrochemistry in process water contaminations – a plant practice**  
H.-R. Manouchehri (Sandvik SRP AB, Sandvik, Sweden)

16.45  **Impact of the milling conditions on the particle properties and flotation of semi-soluble salt-type minerals**  
N. Kupka, A. Hassanzadeh, B. Michaux, S.S.S. Saquran, M. Rudolph (Helmholtz-Institute Freiberg for Resource Technology, Germany) and D. H. Hoang (Helmholtz-Institute Freiberg for Resource Technology, Germany and Maelgwyn Mineral Services Ltd, UK)

17.00-  Sundowner in exhibition area

18.00  Accompanying guests welcome

**Thursday April 30th**

08.00  Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice

08.45  **Technical Session 7**  
Chairmen: TBA

08.45  **Fundamentals and recent developments in fine grinding circuits**  
A. Paz (Outotec Pty Ltd, Australia), R. Jain (Outotec Inc, USA), V. Keikkala and H. Lehto (Outotec Oy, Finland)

09.00  **Can a stirred mill replace a primary ball mill and be competitive in capital and operational costs?**  
H. Erb (Swiss Tower Mills Minerals AG, Switzerland)

09.15  **Development of coarse feed stirred milling – recent test work results**  
C. Rule (Independent Metallurgical Consultant (Seymet Pty Ltd, South Africa), B. Erb (STM, South Africa), M. Halhead and L. Arlow (Anglo American Platinum, South Africa)

09.30  **The up-scaling of the Ro-Star ultra-fine grinding mill and its design for grinding in an inert environment**  
M. Batterby, R. Imhof, D. Hoang (Maelgwyn Mineral Services Ltd, UK), K. Großmann and U. Peuker (Technische Universität Bergakademie Freiberg, Germany)

09.45  **Modelling of gravity induced stirred mill**  
S. Palaniandy (Nippon Eirich Co. Ltd, Australia)
A novel particle-based approach for modelling a wet operated vertical stirred media mill
S. Larsson and P. Jonsén (Luleå University of Technology, Sweden)

Feed and process influences on the multicomponent grinding within a wet operated stirred media mill
M. Nöske, S. Breitung-Faes and A. Kwade (Technische Universität Braunschweig, Germany)

Investigating the effect on power draw and grinding performance when adding shell liners to a vertical fluidised stirred media mill
E.M. Ford (Mintek, South Africa)

Modelling grinding efficiencies from the investigation of energy transfer and particle breakage in stirred media milling technologies
M. Toll, C. Ingham, S. Bailey and G. Dean (Keramos Pty Ltd., Australia)

Guide for ceramic media selection in mining applications
P. Hassall (SEPR Saint Gobain Zirpro, France), A.-L. Beaudonnet, D. Bouttes, N. Benameur and L. Colmuto (Saint-Gobain Research Provence, France)

OPEX reduction focussed regrind media optimisation: a novel approach to media size and product selection
S. Bailey, C. Ingham, M. Toll and G. Dean (Keramos Pty Ltd., Australia)

Unlocking efficiency in stirred mill rotor geometry: VXPmill case study
P. Wulff (FLSmidth, USA)

Dry fine grinding of minerals within a stirred media mill grinding circuit
P. Prziwara, S. Breitung-Faes and A. Kwade (Technische Universität Braunschweig, Germany)

Technical Session 8
Chairmen: TBA

Improving cement grinding performance by using a new bead mill-first industrial application
H. Benzer, O. Altun (Hacettepe University, Turkey), O. Nemli, R. Bilge, L. Onat - Bursa Cement Plant, Turkey), U. Enderle and H. Ünal (Netzsch Feinmahltechnik, Germany)

SMD 355 performance and effect of impeller configuration
C.B Ndimande (University of Cape Town, South Africa, and CSIRO Data61, Australia), P.W. Cleary, M.D. Sinnott (CSIRO Data61, Australia) and A.N. Mainza (University of Cape Town, South Africa)

From steady-state to time dynamic process modelling to minerals processing
M. Evertsson, G. Asbjörnsson and M. Johansson (Chalmers University of Technology, Sweden)

Understanding and utilizing process dynamics in comminution
G. Asbjörnsson, H. Li, M. Johansson and M. Evertsson (Chalmers University of Technology, Sweden)

Improving grinding mill operation using variable speed drives
B. Klein, S. Liu, M. Huang, O. Mejia, F. Wang, T. Cebeci (University of British Columbia, Canada) and I. Atutxa (Ingeteam, Spain)

Real-time mill load optimization using vibration analysis and large scale data analysis
M. Hales, D. Collins and E. Youssefi (KnowledgeScape, USA)

Leveraging an innovative and unique particle size measurement technology in a copper concentrator: transforming data to knowledge to actionable decisions
J. Viega (CIDRA Minerals Processing USA) and J. Felix (Felix Project Management and Consulting Services, South Africa)

Particle size analysis using deep learning techniques
M. McGrath and L. van der Bijl (Stone Three, South Africa)

Predicting mill feed grind characteristics through acoustic measurements
K.B. Owusu, M. Zanin, W. Skinner, R.K. Asamoah (University of South Australia, Australia), J. Karageogos (Manta Controls Pty Ltd, Australia) and C.J. Greet (Magotteaux Pty Ltd, Australia)
16.45 Conference summary
   A. Mainza (University of Cape Town, South Africa)

17.00 Closing remarks and invitation to Comminution ’22
   A.J. Wills (MEI, UK)

17.10 Farewell wine function, Vineyard Gardens
   Accompanying guests welcome