The Block and Sublevel Caving Conferences provide a platform for mining companies to be kept informed of the latest technological developments and caving research carried out by industry and academia and is the only dedicated cave mining international event in the world. The ACG’s priority is the safety and well-being of the delegates, speakers, sponsors and exhibitors of our further education and training conference and events. All attendees are strongly encouraged to attend in person; the ACG looks forward to welcoming many cave mining industry professionals to Adelaide in August 2022. For conference delegates, presentations will be available on-demand for three months, post-event.

Opening Speaker

Dr Craig Stegman
Managing Director, Group Technical
Rio Tinto

Keynote Speakers

Ryan Campbell
Chief Geomechanical Specialist
Freeport-McMoRan Inc., USA
Risk, lessons and opportunities: a unified management approach for mass mining

Simon Hanrahan
Corporate Consultant (Mining)
SRK Consulting
Setting it up for success: considerations for caving projects

Pedro Landeros Córdova
Director of Geotechnical Engineering,
El Teniente Portfolio of Projects
CODELCO, Chile
Geomechanical risks management and control at Andes Norte project: El Teniente mine

**Limited places remaining

acgcaving.com
**Day One: Tuesday 30 August 2022**

### 07:00 REGISTRATION

### 08:00 Welcome to Country by Rolind Coleman

### 08:10 Welcome and introduction by V Potvin. Caving 2022 Conference Chair, Australian Centre for Geomechanics, The University of Western Australia, Australia

### 08:20 OPENING ADDRESS: Cl Stogman, Rio Tinto, Australia

### PLENARY SESSION ONE

**CHAIR: J Wesseloo, Australian Centre for Geomechanics**

| 08:30 | KEYNOTE ADDRESS: Setting it up for success: considerations for caving projects by S Henningson, SRK Consulting, Australia |
| 09:00 | Multi-lifts selection using scenario simulation and financial metrics by D Villas, Dassault Systèmes, Canada; J Romero, Dassault Systèmes, Chile; N Soto, Dassault Systèmes, Canada |
| 09:30 | A risk-based approach to practical scope definition and management at PT Freeport Indonesia by K Llewellyn, PT Freeport Indonesia; R Campbell, Freeport-McMoRan Inc., Canada; A Yuniar, M Sullivan, PT Freeport Indonesia, Indonesia; M Di Cioll, Freeport-McMoran Inc., USA |

### 10:00 MORNING BREAK

### PLENARY SESSION TWO

**CHAIR: S Webster, CMOC-Northparkes Mines**

| 10:30 | Organising for the successful management of complex underground caving mines by J Nowz Tshimanga, Freeport-McMoRan Inc., USA; A Moss, Sandal Technology Inc., Canada; M Sullivan, Freeport-McMoRan Inc., Indonesia; A Yuniar, Freeport-McMoRan Inc., Indonesia; T Cadem, Freeport-McMoRan Inc., USA; C Zimmer, Freeport-McMoRan Inc., Indonesia |
| 11:00 | Northparkes E48 block cave: the mining history of a successful block cave by S Webster, CMOC Northparkes, Australia |
| 11:30 | Developing a geomechanical model for the Jwaneng underground project by MJ Dunn, OZ Minerals, Australia; K Brown, S Webster, J Wesseloo, Australia; A Yuniar, OZ Minerals, Indonesia; R Campbell, Freeport-McMoRan Inc., Canada; M Di Cioll, Freeport-McMoran Inc., USA |

### 12:00 LUNCH

### PARALLEL SESSIONS

#### SESSION ONE: GROUND SUPPORT (1)

**CHAIR TBA**

| 13:00 | Dynamic testing: determining the relationship between rockbolt diameter and the residual dynamic capacity of an axially strained tendon by J Carratt, Epiroc, Australia; G Knox, Epiroc, South Africa |
| 13:20 | Concrete: an enabler of large-scale block and sublevel cave mining projects globally by P Ermann, Sika Services, Switzerland; M Hanner, Sika Services, Sweden; B Krutlik, Lukasavarska-Kลกสนavarska Aktiebolag, Sweden |
| 13:40 | The influence of drilling on the performance of a yielding self-drilling rockbolt by R Abreu, G Knox, Epiroc, South Africa |
| 14:00 | Large-scale dynamic test of ground support systems at the Walenset testing facility by R Brändle, R Luis Fonseca, G van Rikbenk, G Fischer, Geobrugg, Switzerland; A Valdenia, E Marambio, J Burgos, D Cueto, Advanced Mining Technology Center, University of Chile, Chile |
| 14:20 | Performance investigation of the newly developed X-plate by R Darlington, O Valdiani, P Young, Sandvik, Australia |
| 14:40 | Shear performance of yielding self-drilling anchors under controlled conditions by G Knox, J Hadjisotiriou, University of Toronto, Canada |

#### SESSION THREE: MONITORING

**CHAIR C Chauvier, OZ Minerals**

| 15:00 | Seismic event location uncertainty in caving by G Merlet, IGM Geotechnical, Australia; J Wesseloo, Y Potvin, Australian Centre for Geomechanics, The University of Western Australia, Australia |

#### SESSION TWO: PLANNING (1)

**CHAIR A Campbell, Beck Engineering Pty Ltd**

| 13:00 | Carrapateena block cave mine design and planning: feasibility study by Q Zhang, RJ Hocking, OZ Minerals, Australia |
| 13:30 | An iterative design and schedule approach to the E22 block cave project and production planning at CMOC Northparkes Mines: a case study by S Webster, A Moss, CMOCC, Northparkes, Australia; AD Campbell, Beck Engineering, Australia |
| 14:00 | A simulation comparison of operating strategies for electrified block cave mines by S Marais, Q Zhang, OZ Minerals, Australia; C Jusko, S Hegarty-Cramer, K Nguyen, Polymathian, Australia |
| 14:20 | Assessing the reasonable prospects for eventual economic extraction of a caving project by W Bennett, A Fowler, Mining Plus, Australia |
| 14:40 | Ventilation requirements of cave mines by M Hoornan, L van den Berg, H Mohle, BBE Consulting (Australia), Australia; L Paiken, BBE Consulting, South Africa |

#### SESSION FOUR: MUDRUSH

**CHAIR T da Silva, BHP Nickel West**

| 15:00 | Development, reconciliation and visualisation of hang-up frequency and fines entry forecasts at PT Freeport Indonesia by Q Zhao, RJ Hocking, PT Freeport Indonesia; R Campbell, Freeport-McMoRan Inc., Canada; K Taylor, PT Freeport Indonesia, Indonesia; M Fuenzalida, Itasca Consulting Group, Inc., USA; M Diering, Freeport-McMoRan Inc., USA |
| 15:50 | Modelling of wet muck entry at El Teniente for long-term planning by O Solis, R Castro, University of Chile, Chile; E Viera, K Besouare, F Hidalgo, Codelco, Chile; M Pereira, BCTEC Engineering and Technology, Chile |
| 16:10 | Modelling considerations for cave compaction at New Alton Mine by C Camino, M Fuenzalida, Itasca Consulting Group, Inc., USA; C Kamp, New Gold Inc., USA |
| 16:30 | Managing the risk of uncontrolled flow of material (mudrush) at Argyle diamond mine by D Seawright, BHP, Australia; R Hassell, Mining and Civil Integrity Testing, Australia; J Albrecht, Ria Tinto, Australia |
| 16:50 | Impact of draw strategy on wet muck spill hazard severity at the Deep Ore Zone mine by S Charanarvind, S McDougall, M Fuenzalida, Itasca Consulting Group, USA; P Alvarez, BCTEC Engineering and Technology, Chile |
| 17:10 | Monitoring and controls for sublevel caving in an anisotopic rock mass by R Abreu, M Sullivan, PT Freeport Indonesia, Indonesia; R Campbell, Freeport-McMoRan Inc., Canada; A Moss, Sandal Technology Inc., Canada |

#### SESSION SPONSOR

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### 17:30 DAY ONE CLOSE

[acgcaving.com](http://www.acgcaving.com)
Day Two: Wednesday 31 August 2022

Fifth International Conference on Block and Sublevel Caving

Program*

PLENARY SESSION THREE
CHAIR: A van As, The University of Queensland

08:00 KEYNOTE ADDRESS: Risk, lessons and opportunities: a unified management approach for mass mining
R Campbell, Freeport-McMoRan Inc., Canada

08:30 Oyu Tolgoi: engineering a Mongolian caving dynasty
C Stegman, Rio Tinto, Australia; O Togtokhbayar, S Herselman, B Altankhuu, Rio Tinto, Mongolia

09:00 X-ray computer tomography and ground conditions at Northparkes cave edges to further the understanding of the caving mechanisms of strain and hydraulic conductivity
S Yenman, CMOC Northparkes, Australia; N Francois, M Saadatfar, The Australian National University, Australia

09:30 Raise caving: a novel mining method for deep mass mining
T Lednig, Montanauniversität Leoben, Austria; M Wimmer, Luossavaara-Kiirunavaara Aktiebolag, Sweden; H Wagner, Montanauniversität Leoben, Austria

A trial mining with raise caving mining method: one-time chance to prove the concept?
M Karlsson, Luossavaara-Kiirunavaara Aktiebolag, Sweden; T Lednig, Montanauniversität, Austria

PLENARY SESSION FOUR
CHAIR: TBA

10:00 MORNING BREAK

10:30 Controlled reopening of Kiirunavaara production block 22 after a 42 magnitude event
M Svartåsjö, T Rentzeles, Itasca Consultants AB, Sweden; G Shekhar, E Swedberg, M Biskovic, Luossavaara-Kiirunavaara Aktiebolag, Sweden; Y Hebert, Itasca Australia, Australia

11:00 Preliminary results from tests using sublevel caving with 40 m sublevel height at Luossavaara-Kiirunavaara Aktiebolag
C Quintero, A Nordqvist, Luossavaara-Kiirunavaara Aktiebolag, Sweden

11:30 Geotechnical challenges driving the mining method change: transition from sublevel stoping to sublevel caving
M Karlsson, J Ihanus, T Nikkinen, Outokumpu Chrome Oy, Finland

12:00 LUNCH

PARALLEL SESSIONS

SESSION FIVE: GROUND SUPPORT (2)
CHAIR: TBA

13:00 Practical application of deformation-based support design
M Di Ciolo, Freeport-McMoRan Inc., USA; R Campbell, Freeport-McMoRan Inc., Canada; K Taylor, A Pradimatriyash, PT Freeport Indonesia, Indonesia; PK Kater, GeoK Inc, Canada

13:20 Geotechnical and ground support selection for the Oyu Tolgoi crusher chamber #2
G.B. Sharrack, Itasca Australia, Australia; J Ooi, R Tinto, Australia; B Basanayag Oyu Tolgoi LLC, Mongolia

13:40 A probabilistic evaluation of the displacement-based ground support design approach
J Leachman, J De Ross, C Onega, Newcrest Mining Limited, Australia; D Cielo, DC Geotech, Australia

14:00 The B11 support methodologies and quality assurance/quality control systems: creating and implementing a traceable support system
AE Vitaldi do Silvo, BHP, Australia

14:20 Challenges of mining in squeezing ground in hard rock underground mines
B Chapula, Newcrest Mining Limited, Australia; M Makosi, Newcrest Mining Limited, Australia; E Kabwe, Karora Resources, Australia; G Sharrack, Itasca Australia, Australia; Y Kuma, BHP, Australia

14:40 A mixed-method approach for major excavation ground support evaluation
H Speakman, Barrminco, UK

SESSION SIX: SUBSIDENCE
CHAIR: TBA

13:00 Surface subsidence analysis associated with caving at La Encantada Silver Mine
TV Gerpe-Cruz, G Ghazvinian, MA Fuenzalida, Itasca Consulting Group, USA; ME Pierce, Pierce Engineering, USA; E Ladedona, La Encantada Silver Mine, Mexico

13:20 Observed subsidence progression at the New Afton Mine in response to Lift 1 mining
R Davenport, Knight Piesold Ltd., Canada; G Dick, BGC Engineering Inc., Canada; C Kamp, New Gold Inc., Canada

13:40 Mechanical-flow coupled simulation of a proposed multi-panel sublevel shrinkage
C Groeve, Beck Engineering, Australia; F Basson, Newmont Australia Limited Australia, Australia; J Lin, Beck Engineering, Australia; R Kintzel, Newmont, Australia

14:00 Analysis of caving and ground deformations in Malmberget using a coupled CAVESIM–FLAC3D model
M Sjödahl, Itasca Consultants AB, Sweden; L Jonsson, Luossavaara-Kiirunavaara Aktiebolag, Sweden; B Figueroa, J Sjöberg, Itasca Consultants AB, Sweden; F Ershah, Luossavaara-Kiirunavaara Aktiebolag, Sweden

14:20 A coupled modelling approach for discontinuous subsidence at the Cadia East mine
B Sainesbury, Deakin University, Australia; DP Sainsbury, Newcrest Mining Limited, Australia; A Cicora, D Carroll, J Jeff, Newcrest Mining Limited, Australia

14:40 Reviewing Laubscher’s empirical method to estimate subsidence limits
C Contreas, The University of British Columbia, and SRK Consulting, Canada; D Elmo, The University of British Columbia, Canada; J Jakubec, A Thomas, SRK Consulting, Canada

15:00 AFTERNOON BREAK

15:30 Assessing the risk of a sublevel cave – block cave transition using dynamic decision tree analysis overlain with Monte Carlo analysis
PA Pitcher, University College London, UK; JI Hacking, OZ Minerals, Australia

15:50 Management of production drift convergence and rehabilitation
J Kemp, New Gold Inc., Canada

16:10 Application of empirical methods to calculate crown pillar failure in caving mines
J Javade, University of Santiago, Chile; G Barindelli, P Vasquez, Codelco, Chile

16:30 Northparkes E22 deposit: a strategic re-evaluation of mine design and material handling system
O Garcia, S Webster, T Bruning, K Brown, C Schubert, CMOC Northparkes, Australia

16:50 Oyu Tolgoi and Rio Tinto partner with Palantir Technologies to provide effective geotechnical risk management
TR Moonrook, Rio Tinto, UK; K Simanjuntak, O Darijuna, M Sasanakhor, E Emkhhaban, Rio Tinto, Mongolia; G Watt, R Tinto, Australia; E Eckhoff, Palantir Technologies, Australia; J Cerny, Palantir Technologies, UK; D Dancy, T Zimmermann, Palantir Technologies, Australia

17:10 Observed subsidence progression at the New Afton Mine in response to Lift 1 mining
R Davenport, Knight Piesold Ltd., Canada; G Dick, BGC Engineering Inc., Canada; C Kamp, New Gold Inc., Canada

17:30 DAY TWO CLOSE

18:30 DINNER – National Wine Centre of Australia
Day Three: Thursday 1 September 2022

Fifth International Conference on Block and Sublevel Caving

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**PLENARY SESSION FIVE**

**Chair:** TBA

- **08:00** | **KEYNOTE ADDRESS:** Geomechanical risks management and control at Andes Norte project: El Teniente mine | P Leandrinho, Codelco, Chile
- **08:30** | Interpreting cave tracker beacon data at Carrapateena mine | CR Chevrier, OZ Minerals, Australia
- **09:00** | Distributed acoustic sensing/distributed strain sensing technology and its applications for block cave progress monitoring, rock mass preconditioning, and imaging | J Furleny, Z Anderson, Silika, Canada
- **09:30** | Empirical damage prediction in sublevel caving cross-cuts at the Malmberget mine | Th Jones, Luossavaara-Kiirunavaara Aktiebolag, Sweden; D Saiang, Luleå University of Technology, Sweden

**10:00** | **PLenary Session Six**

**Chair:** TBA

- **10:30** | Development of rock mass strength block models at Cadia East mine | DF Pierce, Pierce Engineering, USA; P Stonestreet, C Orrego, D Tennant, Newcrest Mining Limited, Australia; TV Garza-Cruz, J Furleny, C Thiesen, Itasca Consulting Group, Inc., USA
- **11:00** | A review of structural data collection methodologies for discrete fracture network generation | D Stevanovic, J Wessels, M Heinzen Egan, Australian Centre for Geomechanics, The University of Western Australia, Australia
- **11:30** | Back-analysis of gravitational flow MB N01-S01 at Chuquicamata underground mine | JF San Martin, Codelco, Chile; P Castro, University of Chile, Chile; L Arancibia, BCTEC Engineering and Technology, Chile; D Endara, P Vásquez, Codelco, Chile

**12:00** | **Lunch**

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**PARALLEL SESSIONS**

**SESSION NINE: ROCKBURST AND SEISMICITY**

**Chair:** D Cumming-Potvin, Australian Centre for Geomechanics

- **13:00** | The Kiruna seismic event: important insights from the geotechnical model | M Musolin, CR Dáhlin-Lindkvist, UB Anderson, Luossavaara-Kiirunavaara Aktiebolag, Sweden; A Thomas, SRK Consulting, Canada; A Bäckström, Luossavaara-Kiirunavaara Aktiebolag, Sweden
- **13:20** | Characterisation of seismic activity at a kilometer block caving operation in a complex geological setting in Quebec, Canada | RJ Westley-Haulto, Stornoway Diamonds, Canada; S Meyer, Institute of Mine Seismology, Canada
- **13:40** | Abutment loading in deep cave mines: towards understanding susceptibility to stressbursts | J Ryan, The University of British Columbia, Canada; A Primadianto, PT Freeport Indonesia; E Eberhardt, The University of British Columbia, Canada; R Bewick, WSP-Golder, Canada
- **14:00** | Rockburst management at Luossavaara-Kiirunavaara Aktiebolag’s Kiruna mine: what can we learn from COVID-19 management | P Zhang, Luleå University of Technology, Sweden

**SESSION TEN: PLANNING (2)**

**Chair:** G Capes, BHP

- **14:00** | Longevity chart for planning production and the renovation of ore passes | W Sidiropoulos, Luleå University of Technology, Sweden; B Skowina, Luleå University of Technology, and Luossavaara-Kiirunavaara Aktiebolag, Sweden
- **14:20** | A review of rockbursts associated with block caving | Li, C Zhang, J Canbulat, J Olh, S Saydam, The University of New South Wales, Australia
- **14:40** | The planning of a cave re-orientation at the Ernest Henry sublevel cave mine | F Sorensen, L Jordan, W Hartman, Evolution Mining, Australia

**15:00** | **AFTERNOON BREAK**

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**SESSION ELEVEN: HYDRAULIC FRACTURING**

**Chair:** TBA

- **15:30** | Surface hydraulic fracturing trial at Cadia East | G Answer, Newcrest Mining Limited, Australia; S Duffield, Drawpoint Consulting, Australia; J De Ross, G Viegas, Newcrest Mining Limited, Australia
- **15:50** | Modelling of fracture initiation near a cave back and its implications for hydraulic fracturing concurrent to cave mining | R Rimmelin, The University of Queensland, and BHP, Australia
- **16:10** | Multiphysics modelling of fractures in porous media using the eXtended finite element method | A Jafar, UNSW Sydney, Gold Fields Australia, Australia; M Musolin, C Chester, OZ Minerals, Australia; A Ford, Mining One Consultants, Australia
- **16:30** | Stress shadowing effects during hydraulic fracturing in block caving operations | C Mejia, Tegraf Institute, Pontifical Catholic University of Rio de Janeiro, Brazil; E Azad, University of Chile, Chile; D Roehl, Pontifical Catholic University of Rio de Janeiro, Brazil; JA Vetró, University of Chile, Chile; E Rojón, Codelco, Chile

**SESSION TWELVE: CHARACTERISATION**

**Chair:** TBA

- **16:30** | The Equatol hardness method for spatial geotechnical assessment of a Northparkes mine block cave | T Bruning, S Webster, R Tug, CMOC Northparkes, Australia
- **16:50** | Hydrofracturing in the construction of the Andes Norte project | P Nava, Coto, F Henríquez, Codelco, Chile; H Gady, RyG, Chile
- **17:10** | Experimental investigation of hydraulic fracturing in granite under hydrostatic stress conditions | Z Ali, M Karakus, The University of Adelaide, Australia
- **17:30** | Closing Address: Caving 2022 Conference Chair, Australian Centre for Geomechanics, The University of Western Australia, Australia

**17:40** | **Conference Close**

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*Correct as at time of printing and subject to change. See acgcaving.com for updates.*
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After the Big Bang Workshop: *Rehabilitation and resumption of production in Block 22 at the Kiruna mine after the 4.2 magnitude seismic event*

28 August 2022 | Ballroom C, Hilton Adelaide, South Australia | Online

The workshop will be held prior to Caving 2022 both in person and online.

**Objectives**

The Kiirunavaara mine situated in northern Sweden is the largest sublevel caving operation in the world with an average annual production of 27 Mt. On 18 May 2020, the mine experienced a seismic event that was, by far, larger than anything previously experienced. Based on the regional seismic networks, the moment magnitude was estimated to 4.2. The regional networks had to be used for magnitude estimation, since it exceeded the range of the mine’s seismic system. The event occurred in the central part of the mine and caused major damage to the footwall infrastructure over a length of around 700 m on several sublevels. Following the event, the mine started a concentrated effort to rehabilitate and restart the central production blocks under ‘Block 22 Project’. The mine has worked intensively since August 2020 on this project and is expected to start production by Q2 2022. In this workshop, the problem statement, the challenges, and the proposed solution for resuming production in the central blocks will be presented for the international caving community. The two primary objectives of the workshop are:

- Share experiences from the project
- Generate active audience inputs on possible improvements

**Who should attend**

Participants who are interested in learning about the different aspects of caving operations ranging from geotechnical challenges, seismic analysis, rehabilitation strategies, numerical modelling, mine instrumentation, mining sequence, mine planning and draw control.

**Workshop Presenters**

- **Mirjana Boskovic**, Seismic Analysis Specialist, LKAB, Sweden
- **Dr Nikolaos Petropoulos**, Senior Researcher, LKAB, & Assistant Professor, Luleå University of Technology, Sweden
- **Dr Gurmeet Shekhar**, Senior Mining Engineer, LKAB, Sweden
- **Dr Mikael Svartsjaern**, Senior Rock Mechanics Engineer, Itasca, Sweden
- **Erik Swedberg**, Rock Mechanics Engineer, LKAB, Sweden

**Workshop Host**

[Image of LKAB logo]

See program overleaf
**Associated Event**

**Fifth International Conference on Block and Sublevel Caving**

**After the Big Bang Workshop:** *Rehabilitation and resumption of production in Block 22 at the Kiruna mine after the 4.2 magnitude seismic event*

28 August 2022 | Ballroom C, Hilton Adelaide, South Australia | Online

**Workshop Program***

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>11:30</td>
<td>Registration</td>
</tr>
<tr>
<td>12:00</td>
<td>Welcome and background <em>Overview, challenges with mining sequence before the event, local geology and geotechnical information</em></td>
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<tr>
<td>12:15</td>
<td>Description of the seismic event <em>Details about the seismic event and forensic analysis of the event</em></td>
</tr>
<tr>
<td>12:30</td>
<td>Description of the seismic event <em>Details about the seismic event and forensic analysis of the event</em></td>
</tr>
<tr>
<td>12:50</td>
<td>Damage mapping and development <em>Damage mapping of the production block, plan for rehabilitation, plan for new footwall drive, use of instrumentation for mapping, and seismic response during development</em></td>
</tr>
<tr>
<td>13:00</td>
<td>Mining sequence and rock mass state <em>Selection of which level to resume production (1079 versus 1108), advantages of each option, extension of crosscuts to increase hydraulic radius</em></td>
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<tr>
<td>13:30</td>
<td>Discussion <em>At which level should production start: 1079 versus 1108</em></td>
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<tr>
<td>14:00</td>
<td>Afternoon break</td>
</tr>
<tr>
<td>14:30</td>
<td>Local mining sequence and rock mass response <em>Selection of the direction of mining (north to south versus south to north), challenges with cave propagation, rehabilitation of crosscuts between old and new footwall drifts, challenges with ring design, and blasting design for the production level</em></td>
</tr>
<tr>
<td>15:00</td>
<td>Discussion <em>What mining direction should be selected? Rehabilitation crosscuts on cave propagation and confinement of pillar</em></td>
</tr>
<tr>
<td>15:30</td>
<td>Monitoring systems and risk assessment <em>Describe the various instrumentation and monitoring systems installed in the production area, highlight the key risk the mine has identified in the project</em></td>
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<tr>
<td>16:00</td>
<td>Discussion <em>Additional risks missed in the assessment</em></td>
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<tr>
<td>16:20</td>
<td>Concluding comments</td>
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<tr>
<td>16:30</td>
<td>Workshop close – ACG networking drinks &amp; nibbles</td>
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**Professional Development Hours**

Up to 4 PD Hours

*This program is subject to change. For updates visit [acgcaving.com/big-bang-workshop](http://acgcaving.com/big-bang-workshop)*
The workshop will be held immediately prior to Caving 2022. The workshop is applicable to block and panel caving methods only. Cave mining owes its increasing popularity to its low operating cost and high productivity. However, the whole mine infrastructure must be designed and constructed before production begins. Consequently, all the design parameters are locked in at a very early stage, long before the extraction of the cave column is initiated. As such, cave mining is a very inflexible mining method. The consequences associated with poor design are extreme, as opportunities for recovering once production starts is almost nil.

As there could be no good design without high quality and sufficient quantity of data, the pathway from data to design in cave mining is paramount. Mining methods, other than caving, have an opportunity to continuously gather data and adjust their mine design. In caving, the gathering, interpretation of data and design work must be condensed and completed within a few years, with hardly any opportunities to modify and improve the design during mining.

This emphasises the criticality of efficient and accurate data collection, with the data being fed into design techniques, on a critical path, within a very tight timeframe during scoping and feasibility studies. This workshop will explore what are the best practices in cave mining data collection, management and interpretation, and the key design techniques currently used at different stages of caving projects. There will be an emphasis on the timeline from data to design, and the advantages and limitations of different approaches.

Delegates are able to participate both in person and online.

**Workshop Facilitators**

**Professor Yves Potvin**  
*Professor of Mining Geomechanics*  
*Australian Centre for Geomechanics*

**Professor Andre van As**  
*Group Leader - Deep Mining Geoscience*  
*The University of Queensland*

**Associated Event**

Fifth International Conference on Block and Sublevel Caving

**Panel/Block Caving Workshop: From Data to Design**

29 August 2022 | Ballroom C, Hilton Adelaide, South Australia | Online

See program overleaf

**Professional Development Hours**  
Up to 7.5 PD Hours

acgcaving.com
### Workshop Program*

**Session 1: Data for cave mining design** *Facilitator: Professor Yves Potvin, Australian Centre for Geomechanics*

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<td>Welcome and introduction <em>Professor Yves Potvin, Australian Centre for Geomechanics</em></td>
</tr>
<tr>
<td>08:10</td>
<td>Data quality, quantity and uncertainty <em>Chris Chester, OZ Minerals</em></td>
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<tr>
<td>08:40</td>
<td>TBA <em>Professor Andre van As</em></td>
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<tr>
<td>09:10</td>
<td>Discussion</td>
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<tr>
<td>09:40</td>
<td>MORNING BREAK</td>
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</tbody>
</table>

**Session 2: Determining caveability** *Facilitator: Professor Andre van As, The University of Queensland*

<table>
<thead>
<tr>
<th>Time</th>
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<tr>
<td>10:00</td>
<td>Geotechnical and operational considerations <em>Karl Llewelyn, PT Freeport Indonesia, Indonesia</em></td>
</tr>
<tr>
<td>10:30</td>
<td>Tools for caveability assessment and key decisions <em>Cristián Orrego, Newcrest Mining Limited</em></td>
</tr>
<tr>
<td>11:00</td>
<td>Discussion</td>
</tr>
<tr>
<td>11:30</td>
<td>LUNCH</td>
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</table>

**Session 3: Footprint layout design** *Facilitator: Professor Yves Potvin*

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<th>Time</th>
<th>Activity</th>
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<tr>
<td>12:15</td>
<td>Geotechnical and operational considerations <em>Josef Ekkerd, Rio Tinto</em></td>
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<td>12:45</td>
<td>Tools for footprint layout and key decisions <em>Associate Professor Glenn Sharrock, Itasca Australia Ltd; Miguel Fuenzalida, Itasca Consulting Group Inc., USA</em></td>
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<td>13:15</td>
<td>Discussion</td>
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**Session 4: Developing undercutting strategy** *Facilitator: Professor Andre van As*

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<tr>
<td>14:00</td>
<td>Geotechnical and operational considerations <em>Corey Kamp, New Gold Inc., Canada</em></td>
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<td>14:30</td>
<td>Tools for undercutting strategy and key decisions <em>Dr Alex Campbell, Beck Engineering Pty Ltd</em></td>
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<td>15:00</td>
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**Session 5: Drawing strategy and cave performance** *Facilitator: Professor Yves Potvin*

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<tr>
<td>15:45</td>
<td>Geotechnical and operational considerations <em>Sarah Webster, CMOC Mining Services Pty Ltd</em></td>
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<td>16:15</td>
<td>Tools for drawing strategy and key decisions <em>Gert Van Hout, Gatco Consulting, Belgium</em></td>
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<td>16:45</td>
<td>Discussion</td>
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<tr>
<td>17:15</td>
<td>WORKSHOP CLOSE – DRINKS AND NIBBLES</td>
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*This program is subject to change. For updates visit acgcaving.com/block-caving-workshop/
2022 Caving Community of Practice – Unconference

2 September 2022 | Ballroom C, Hilton Adelaide, South Australia | In-person only

An unconference is a participant-led conference format that utilises small breakout groups to discuss and present on matters of interest and relevance to the attendees. It is less formal than a traditional conference and provides attendees with a collaborative environment within which to discuss matters raised in the ACG Caving 2022 Conference or other pressing issues.

Timings:
08:30  Registration
09:00  Welcome and introduction
16:00  Unconference conclusion

This event is free to register for and limited to Caving 2022 Conference attendees. The unconference will be held in-person only. Tick the box for attendance to the Unconference when registering for the conference at acgcaving.com/register.

Site Visit

OZ Minerals Carrapateena Site Visit

3 September 2022 | South Australia

One of the biggest mining projects in South Australia in the last decade, Carrapateena Province is in the highly prospective Gawler Craton in South Australia. It’s already set to become a multi-generational, low-cost mining province.

This site visit is open to Caving 2022 Conference attendees only.

Applications now closed.

Conference Venue

Conference Venue: Hilton Adelaide

Hilton Adelaide
233 Victoria Square, Adelaide, SA 5000 Australia
+61 8 8217 2000
adelaide.hilton.com

For accommodation options in and around the conference venue, visit acgcaving.com/accommodation

Principal Partners
To register online with credit card payment, go to acgcaving.com/register

### CONTACT DETAILS

Please print. *denotes mandatory fields.

*Title (Mr, Mrs, Miss, Ms, Dr, Prof., Other) ____________________________________________

*Family Name __________________________________________________________

*First Name ________________________________________________________________

Preferred Name ____________________________________________________________

*Position _________________________________________________________________

*Organisation ______________________________________________________________

Mine/Dept _________________________________________________________________

*Mailing Address __________________________________________________________

___________________________________________________________________________

Preferred Phone (__________) ________________________________________________

**Email _________________________________________________________________

**All confirmations/event updates will be sent via email.

☐ I am attending this event in-person, COVID-19 permitting.

Please notify us below of any special dietary requirements.

The events authorised attendee list is made available to event attendees, sponsors and exhibitors, who may contact you, including electronically.

☐ I give permission for my details to be included in the Caving 2022 and associated event attendee lists.

☐ I give permission for the ACG to add me to their communications list*.

☐ I require an invitation letter for visa purposes (please forward a copy of your passport information page). For more information regarding Australian visas, please visit immi.homeaffairs.gov.au/visas

*Update your communication preferences at acg.uwa.edu.au/acgcommunication/

Please advise your LinkedIn profile.

linkedin.com/in/_________________________________________________________________

By submitting this registration, I accept the Terms and Conditions, available at acgcaving.com/disclaimer

### PAYMENT

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<td>Standard</td>
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<tr>
<td>ACG Affiliate†</td>
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<tr>
<td>Student^</td>
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| 2,200 | 1,980 | 660 |

† acg.uwa.edu.au/corporate-affiliate

^ Students are required to provide proof of full-time enrolment.

Conference papers will be accessible at papers.acg.uwa.edu.au from 22 August 2022.

Caving 2022 Printed Proceedings (Softbound, colour) (Conference special)

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Caving 2022 Conference Dinner

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31 August 2022 - Limited spots remaining

After the Big Bang Workshop (2203) 28 August 2022

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ACG Affiliate†

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Student^  

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Panel/Block Caving Workshop: From Data to Design (2204) 29 August 2022

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ACG Affiliate†

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Student^  

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2022 Caving Community of Practice – Unconference (2206) 2 September 2022 | Limited spots remaining

In-person attendance

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Free registration

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Special offer on the purchase of Ground Support for underground mines book for Caving 2022 delegates:

<table>
<thead>
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<th>Ground Support book for Australian residents/in-person attendees</th>
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Ground Support book for international residents/online attendees

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How to register:  
Australian Centre for Geomechanics  
The University of Western Australia  
35 Stirling Highway (M600)  
Crawley WA 6009  
+61 8 6488 3300  
info-acg@uwa.edu.au  
acgcaving.com