Day One: Tuesday 10 October 2023

07:30 REGISTRATION

08:30 Welcome and introduction by J Wesseloo, Ground Support 2023 Conference Chair, Australian Centre for Geomechanics, The University of Western Australia, Australia

SESSION ONE: MONITORING (1) - SOUTH BALLROOM

CHAIR: A Page, Geotechnical Mining Services

08:45 KEYNOTE ADDRESS: The ground support life cycle considering real time ground-consumption monitoring by W Bawden, Mine Design Technologies, Canada

09:30 xCell Cyclops: a new technology for an efficient way of monitoring convergence in underground mines by O Vallati, Sandvik, Australia; P Young, S Weaver, Sandvik, Australia

10:00 Principal Sponsor address: Jennmar

10:05 MORNING BREAK

SESSION TWO: MONITORING (2) - SOUTH BALLROOM

CHAIR: P Mather, Regis Resources Ltd

10:35 High-resolution ground-deformation and support monitoring using a portable handheld LiDAR approach by S Mercer, J Morgenroth, RockMass Technologies, Canada; B Simser, Glencore, Canada

11:05 Monitoring of rock mass movement using a distributed array of wi-fi enabled extensometers by S MacGregor, P Seaward, SCT Operations, Australia; M Farrington, Agnico Eagle Mines, Australia

11:35 Automated ground support deformation monitoring; a novel method with new opportunities for geotechnical engineers by J Franke, C Gonzalez, Caroni Geospatial, Australia

12:05 Practical application of mXrap Damage Mapping application at Nova nickel mine by M Lane, IGO Limited, Australia; D Cumming-Patvin, Australian Centre for Geomechanics, The University of Western Australia, Australia

12:35 LUNCH

PARALLEL SESSIONS

SESSION THREE A: SUPPORT FOR DYNAMIC CONDITIONS (1) - SOUTH BALLROOM

CHAIR: L Moreau-Verlaan, RockEng Inc., Canada

13:30 Estimate of ground support response under dynamic loads at El Teniente mine, Codelco, Chile by M5 Celis, RA Parraguez, Codelco, Chile

14:05 Empirical charting for dynamic ground support at Flying Fox and Spotted Quoll mines by J Graham, U Waheed, IGO Limited, Australia; P Mikula, Mikula Geotechnics, Australia

14:35 Evolution of dynamic rock support systems at the El Teniente mine by T El Rojas, A Muñoz, P Landeros Córdova, Codelco, Chile

15:05 Case study: use of rebars with microalloyed steels in tunnels with induced seismicity by A Muñoz, C Cifuentes, Codelco, Chile

15:35 AFTERNOON BREAK

SESSION THREE B: PORTALS AND LARGE CHAMBERS - FRESHWATER BAY ROOM

CHAIR: MJ Dunn, Debswana Diamond Company, Australia; TT Parrott, Entech, Australia

16:05 Design, development and testing of the Falcon Bolt by R Galluzzi, M Holden, A Dodds, J Matthews, A Bennett, Jennmar, Australia

16:35 Dynamic impact and static testing of self-drilling dynamic bolt types installed in Normet's urea-silicate injection resin: a new path forward to reducing worker exposure to high-stress ground conditions by A Punkkinen, Normet Canada Ltd, Canada; G Li, Queen's University, Canada, and Hebei University of Engineering, China; A Taheri, Queen's University, Canada

17:05 Adopting hollow bar: lessons learned by A Bergman, E Fjellner, P Hallén, Boliden, Sweden; R Penezek, DSI Underground, Finland; K Pérez Hidalgo, Boliden, Sweden; F Scolari, DSI Underground, Italy; M Svaneberg, DSI Underground, Sweden

17:30 DAY ONE CLOSE

*Correct as at 3 October 2023 and subject to change. See acggroundsupport.com/program for updates.

Conference Venue and Accommodation

The ACG team is delighted to be hosting the Ground Support 2023 conference at the Hyatt Regency Hotel Perth. To learn more and book your accommodation, visit acggroundsupport.com/conference-venue
### Day Two: Wednesday 11 October 2023

#### SESSION ONE: DYNAMIC TESTING OF REINFORCEMENT - SOUTH BALLROOM

**CHAIR**  
D Sewnun, Australian Centre for Geomechanics  

- **08:30** KEYNOTE ADDRESS: Laboratory-based drop testing of rock reinforcement  
  Dr Will Bawden, President, Mine Design Technologies, Canada  
  **Keynote title:** The ground support life cycle considering real-time ground-consumption monitoring  

- **09:15** A comparison between laboratory and in situ dynamic testing on the MDX bolt  
  B Darlington, O Vallati, P Young, Sandvik, Australia  

- **09:45** MORNING BREAK

#### SESSION TWO: SUPPORT FOR DYNAMIC CONDITIONS (2) - SOUTH BALLROOM

**CHAIR**  
I Morkel, IGM Geotechnical  

- **10:15** Dynamic modelling of strainbursting around tunnels  
  A Rigby, Institute of Mine Seismology, Australia  

- **10:45** Delineation of hazard-based design events for dynamic support system analysis  
  N Dadashzadeh, L Moreau-Verlaan, K Kalenchuk, RockEng Inc, Canada  

- **11:15** Utilisation of seismic data in the assessment of displacement and energy demand imposed on ground support by strainbursts  
  D Malovichko, Institute of Mine Seismology, Australia  

- **11:45** Dynamic support evaluations for implementation by seismic hazard domains  
  K Kalenchuk, N Dadashzadeh, L Moreau-Verlaan, RockEng Inc, Canada  

#### LUNCH

#### SESSION THREE A: LABORATORY TESTING OF MESH - SOUTH BALLROOM  

**CHAIR**  
W Duan, Westgold Resources Limited  

- **13:15** A review of ground support mesh testing around the world  
  IG Morkel, IGM Geotechnical, Australia; PA Mikula, Mikula Geotechnics, Australia; RK Whiting, Rowland Whiting Technical Services, Australia  

- **13:45** Large-scale tests of weld mesh versus high-tensile chain link mesh on mesh overlap load transfer  
  R Brändle, Geobrugg, Switzerland; R Bucher, Geobrugg, Australia  

#### SESSION THREE B: CORROSION - FRESHWATER BAY ROOM

**CHAIR**  
R Hassell, Mining & Civil Integrity Testing  

- **13:45** Importance and development of pre-tension on bolt support systems: Implications to hanging wall beam stability  
  MN Masitise, M Muzavazi, Mohlalefi Engineering, South Africa  

#### SESSION THREE C: PRE-TENSION - FRESHWATER BAY ROOM

- **14:15** A laboratory-scale dynamic test of load distribution elements at Rancagua testing facility  
  M Hinojosa, JA Vallejos, E Marambio, Universidad de Chile, Chile; G Fischer, G von Rickenbach, Geobrugg, Chile  

- **14:45** Afternoon Break

#### SESSION FOUR: SUPPORT MECHANISMS - SOUTH BALLROOM

**CHAIR**  
A Kusui, Beck Engineering  

- **15:15** Simulating static pull tests, shear tests and dynamic drop tests to identify basic parameters for subsequent support design  
  PM Dight, Australian Centre for Geomechanics, The University of Western Australia, Australia  

- **15:45** Performance in shear of mechanical hybrid rockbolts  
  G Knox, J Hadjigeorgiou, University of Toronto, Canada  

- **16:15** Effect of mobilised length on the performance of a paddled energy-absorbing rockbolt  
  DL Venter, Epiroc, Australia; G Knox, Epiroc, South Africa  

- **16:45** DAY TWO CLOSE

#### 18:30 DINNER - OPTUS STADIUM

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**Keynote Speakers**

- **Dr Will Bawden**  
  President, Mine Design Technologies, Canada  
  **Keynote title:** The ground support life cycle considering real-time ground-consumption monitoring

- **Greig Knox**  
  PhD Student, University of Toronto, Canada  
  **Keynote title:** Laboratory impact testing of rock reinforcement
## Conference Program

### Day Three: Thursday 12 October 2023

**Conference Program**

**Ground Support 2023**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Description</th>
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<tbody>
<tr>
<td>08:30</td>
<td>Numerical forecast of central access ground support behaviour at Cadia East PC1-2</td>
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<tr>
<td>09:15</td>
<td>Suggested framework for design effort and acceptance criteria for underground mine excavations</td>
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<td>09:45</td>
<td>MORNING BREAK</td>
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<tr>
<td>10:15</td>
<td>Vuggy and cavernous rock mass conditions: implications for the early detection, management, ground support and development of tunnels</td>
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<td>10:45</td>
<td>Evolution of ground support designs for blasthole stopping in kimberlite at Diavik Diamond Mine</td>
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<tr>
<td>11:15</td>
<td>A numerical approach for a displacement-based ground support capacity consumption forecast</td>
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<td>11:45</td>
<td>LUNCH</td>
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<tr>
<td>12:45</td>
<td>Improving underground development cycle time using performance mine grouts</td>
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<tr>
<td>13:15</td>
<td>Application of modern pumpable polyester resin to the mining cycle</td>
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<td>13:45</td>
<td>How the strength and deformability of thixotropic resins depend on their structure and what is the true thixotropic behaviour of the mixture</td>
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<tr>
<td>14:15</td>
<td>Trial of high early-strength grout-hardening accelerating admixture for cable bolts</td>
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<td>14:45</td>
<td>AFTERNOON BREAK</td>
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<tr>
<td>15:15</td>
<td>A case study for rebar-reinforced shotcrete arches and void filling at the Grasberg Block Cave mine, Indonesia</td>
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<td>15:45</td>
<td>Stabilising drawpoints for breccia stopes</td>
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<td>16:15</td>
<td>Installation of lattice girders with Toussaint–Heintzmann yielding elements in poor ground</td>
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<tr>
<td>16:45</td>
<td>FAREWELL ADDRESS AND CLOSE</td>
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**Professional Development Hours**

Attendance at Ground Support 2023 may entitle you to up to 20 PD hours. Please email info-acg@uwa.edu.au for your certificate of attendance, post-event.

**Conference Dinner**

Venue: Optus Stadium, Victory Lounge, Access via Gate D
Address: 333 Victoria Park Dr, Burswood WA 6100
Date: Wednesday 11 October 2023
Time: 18:30
Dress: Smart casual

Registered attendees will enjoy an evening of networking, sweeping views and a sit-down, three-course dinner in one of Perth’s most exciting venues, Optus Stadium, situated on the banks of the picturesque Swan River.

Dinner is now SOLD OUT.

acggroundsupport.com