Mine Seismology Workshop

15-17 October 2024, Kalgoorlie, WMC Conference Centre

Tuesday 15 October	09h00 – 17h00	Primer Course on the Basics of Mine Seismology and Operating Seismic Monitoring Systems in Mines
Wednesday 16 October	09h00 – 17h00	Presentations on Implementation and Applications of Seismic Monitoring in Mines
	18h15	Dinner hosted by the Institute of Mine Seismology
Thursday 17 October	09h00 – 17h00	Presentations on Mine Seismology and Training in IMS Software

The registration fee is AUD 150 / day (incl. tea / coffee) for in-person attendance.

For more information and registration please visit IMS web site.

Tuesday 15 October – Day 1, Room 111

Primer Course on the Basics of Mine Seismology and Operating Seismic Monitoring Systems in Mines

The objective of the course is to explain the elementary principles of seismology and seismic monitoring in mines to non-seismologists.

09:00 | **Basics of mine seismology**, *Dr Dmitriy Malovichko*
Objectives of seismic monitoring in mines; seismic waves and seismic sources; seismic monitoring systems; location of seismic events; basic and derivative source parameters; source mechanisms; classification of seismic events; parameters of seismicity; analysis and interpretation of seismicity.

——— Lunch ———

14:00 | **Basics of mine seismology - continued**, *Dr Dmitriy Malovichko*

15:00 | **Seismic monitoring system in mines**, *Dr Alejandro Jaimes*
Planning, budgeting, installing and maintaining of seismic monitoring systems in mines.

Wednesday 16 October – Day 2, Room 111

Presentations on Implementation and Applications of Seismic Monitoring in Mines

09h00 | **Welcome and Introduction**
Dr Dmitriy Malovichko (Institute of Mine Seismology)

09h15 | **The design of an informative quarterly seismicity report for an underground mine**
Dr Peter Mikula (Mikula Geotechnics)

09h45 | **Detecting self-mining crown pillars**
Lyn Van Den Elzen (Northern Star Limited – South Kalgoorlie Operations)

10h15 | **Where could crush and slip-type events be in a mine**
Wei Duan (Westgold – Big Bell Mine)

——— Coffee/tea break ———

11h00 | **Seismicity at Gwalia mine site**
Obaid Khan (Genesis Minerals – Gwalia Mine)

11h30 | **Seismic monitoring from the (under)ground up: integrating the Boston Shaker seismic system into the mine plan**
Andrew Wilson (Operational Geotechs)

12h00 | **Rockburst hazard assessment (RBHA) methodology**
Dr Dmitriy Malovichko (Institute of Mine Seismology)

12h30 | **Session closure - discussion**

——— Lunch ———

14h00 | From seismological to geotechnical parameters: Using Machine-Learning-based tomography to infer vertical propagation of a cave's yield zone
Dr Alejandro Jaimes (Institute of Mine Seismology)

14h30 | Forecasting shaking and bulking ground velocities around tunnels for a planned mining sequence
Dr Dmitriy Malovichko (Institute of Mine Seismology)

15h00 | Quantifying large and finite seismic events in underground mines
Dr Alejandro Jaimes (Institute of Mine Seismology)

15h30 | Stress inversion from slip- and crush-type seismic events in mines
Dr Dmitriy Malovichko (Institute of Mine Seismology)

16h00 | Session closure - discussion

Dinner hosted by the Institute of Mine Seismology

18h15 | Balcony Bar & Restaurant, Palace Hotel

Thursday 17 October – Day 3, Room 5

Presentations on Mine Seismology and Training in IMS Software

There will be a combination of theoretical presentations and practical exercises explaining and illustrating the processing and interpretation of seismic monitoring data.
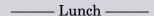
09h00 | **Monitoring seismicity with IMS Ticker3D**, *Dr Dmitriy Malovichko*

- Live Viewer:

    – System health and management.
    – Viewing/managing seismic data.
    – TARP automated tool for control room users.
    – STAT and GMAP re-entry tools.

10h30 | **Rockburst hazard assessment (RBHA) tool - demonstration and training**, *Dr Dmitriy Malovichko*

- Importing data: excavation geometries, rockmass properties, stress model results, seismic data, and ground support specifications.

- Tunnel nodes: creation from excavation geometries, mapping of data, and controlling with timeline.

- Calculation of results: engineering demand parameters, rockburst potential, and rockburst hazard.

- Presentation of results: maps, time histories, displacement-energy plot, tabular view, and exporting.

———— Lunch ————

14h00 | Source mechanisms - from inversion to analysis in IMS Trace and IMS Vantage, *Dr Alejandro Jaimes*

- Theory and requirements.

- Source mechanism inversion in IMS Trace.

- Quality control of source mechanisms.

- Utility of source mechanisms in IMS Vantage.

14h45 | Analysis of seismic data with IMS Vantage, *Dr Alejandro Jaimes*

- Long Term Analysis:

  – Viewing and analysing long term seismic data.
  – Generation of seismic plots and their utility.

15h30 | IMS Nexus - Modernising the way we visualise seismicity, *Dr Alejandro Jaimes*

- Accessing the results of seismic monitoring and related protocols on the go.

- Demonstration of features, including full 3D interaction and options to inspect individual events and their source parameters.