



institute
of mine
seismology

&



UNSW
SYDNEY

Mine Seismology Workshop



**7-9 February 2022, University of New South Wales,
School of Minerals and Energy Resources Engineering
(with online streaming)**

Monday 7 February	09h00 – 16h00	Primer Course on the Basics of Mine Seismology
Tuesday 8 February	09h00 – 17h00	Presentations on Implementation and Applications of Seismic Monitoring in Mines
Wednesday 9 February	09h00 – 17h00	Presentations on Mine Seismology and Training in IMS Software (Ticker3D)

The registration fee is AUD 150 / day (incl. tea / coffee) for in-person attendance and AUD 75 / day for online attendance.

Presenters have 100% discount for the day of presentation.

Students and lecturers of UNSW attend for free, but require registration. Students of other universities have 50% discount provided proof of student registration is sent to IMS.

For more information and registration please visit IMS web site. Note that the number of in-person attendees is limited due to social distance rule in NSW.

Monday 7 February – Day 1, Room G51 in the Old Main Building at UNSW

Primer Course on the Basics of Mine Seismology

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

Tuesday 8 February – Day 2, Room G51 in the Old Main Building at UNSW

Presentations on Implementation and Applications of Seismic Monitoring in Mines

The workshop is aimed at promoting discussion on best practices for seismic monitoring in mines. These will cover various topics of mine seismology and seismic monitoring: mechanisms of seismic events and mechanics of rockburst damage, processing of seismic monitoring data, audit of assumptions adopted in mine design and planning (e.g. parameters of *in situ* stress field), re-entry protocols after blasts and large seismic events, assessment of seismic hazard and rockburst hazard.

Geotechnical practitioners are invited to share their experience with seismic monitoring at particular mines.

If you would like to present please send an e-mail to: Dmitriy.Malovichko@IMSeismology.org. The current list of presenters is as follows:

A case study on the T20 micro seismic monitoring system at Cadia East mine

Iain Lindley (Newcrest Mining Limited)

An overview of the seismic system upgrade plan for the Cadia Expansion project

Ayako Kusui (Newcrest Mining Limited)

Seismic system utilisation during a hydrofracturing program at Cadia East mine

Lawrence Custodio (Newcrest Mining Limited)

Planned Short Term Activity Tracker (STAT) utilisation for the upcoming PC2-3 Cadia East undercutting phase

Ashmita Boodoo (Newcrest Mining Limited)

Estimation of displacement and energy demand for burst resistant support design

Dr Peter K. Kaiser (GeoK & Professor Emeritus, Laurentian University) - on-line lecture

Prediction of relatively high-energy seismic events using spatial-temporal parametrisation of mining-induced seismicity

Dr Guangyao Si (University of New South Wales)

Seismic impacts and source parameters correction for assessing dynamic failure risks in underground mines

Changbin Wang (University of New South Wales)

Crush-type seismic events in mines: interpretation and utilisation

Dr Dmitriy Malovichko (Institute of Mine Seismology)

Ground motion hazard and likelihood of shakedown damage

Dr Dmitriy Malovichko (Institute of Mine Seismology)

Wednesday 9 February – Day 3, Room G51 in the Old Main Building at UNSW

Presentations on Mine Seismology and Training in IMS Software (Ticker3D)

There will be a combination of theoretical presentations and practical exercises explaining and illustrating the processing and interpretation of seismic monitoring data. Attendees with modern laptops will receive IMS software with which to perform hands-on tasks during training and gain experience. Note that in order to run IMS software, we strongly recommend a machine with at least 8GB of RAM and a modern 3D graphics card (NVidia or AMD) with up-to-date drivers installed.

What Can Go Wrong in Seismic Monitoring, *Dr Dmitriy Malovichko*

- Problems with settings of seismic sites (coordinates, orientation, response) and their effect to data analysis.
- Issues with data acquisition and processing settings (array configuration, synchronization, velocity model, classification of events, source calculation parameters) and their effect on data analysis.
- How to detect problems in a catalogue of seismic events.

Monitoring Seismicity with IMS Ticker3D, *Gys Basson*

- Live Viewer:
 - System health and management.
 - Viewing/managing seismic data.
 - STAT (re-entry) tool.
 - TARP automated tool for control room users.

- Long Term Analysis:
 - Viewing/managing long term seismic data.
 - Production data management, basic reports.
 - Sensitivity analysis.
 - Seismic plots.

Utility of Seismic Source Mechanisms, *Dr Dmitriy Malovichko*

- Mechanisms of seismic sources: slip on a structure, pillar burst and abutment failure, rock fall, blast.
- Forensic analysis of large and damaging seismic events: understanding the source and damage.
- Source mechanisms and stress field: inversion of the orientation of principal stresses and calibration of numerical models.

Modelling tools in IMS software, *Gys Basson*

- Viewing stress modelling results for different mining layouts.
- Integrating stress modelling results with seismic data.
- Modelling results in seismic reports.