



**AUSTRALIAN ACADEMY OF SCIENCE
NATIONAL COMMITTEE FOR MATHEMATICAL SCIENCES
BUSINESS AND INDUSTRY SUBCOMMITTEE
DECADEL PLAN FOR MATHEMATICAL SCIENCES**

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Contact:

The Australasian Institute of Mining and Metallurgy

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About The AusIMM

The Australasian Institute of Mining and Metallurgy (The AusIMM) was formed in 1893 and is the leading organisation representing over 13,500 minerals sector professional members in the Australasian region, across industry, government and academia.

Our members include professionals from traditional disciplines such as mining engineers, geoscientists and metallurgists, as well as from emerging disciplines such as business management, health and safety, social and environmental science.

With a focus on 'enhancing professional excellence', The AusIMM provides members with an ongoing program of professional development opportunities to ensure our members are supported throughout their careers to provide high quality professional input to industry and the community.

Submission

This submission is in response to the invitation from the National Committee for Mathematical Sciences seeking an Institute perspective on the contribution of Mathematical Sciences to the minerals sector.

At the sector level, mathematical sciences are critical to the future development of the minerals sector in Australia. They underpin the ability to successfully explore, finance, construct, operate and close mining operations productively and competitively.

At the minerals professional level, our members represent many different professional disciplines across small, medium and large business, consulting, academia and research. Many AusIMM members hold qualifications from science, technology, engineering and mathematics (STEM) disciplines including:

- Geosciences
- Metallurgy and Minerals Processing
- Engineering (Geotechnical, mining, materials etc.)
- Environmental Sciences,
- Health and Safety
- Finance and Economics
- Management
- Marketing/Communications

The following are examples of how minerals professionals use and apply mathematical sciences to their work:

- Modelling ore bodies, ore reserves and resource estimation
- Undertaking feasibility analysis and obtaining financial approval
- Modelling in relation to optimisation of the mining process (for example undertaking computational fluid dynamics in mine ventilation, optimising rock drilling and blasting)
- Automating mining processes through robotics and systems control
- Optimising health and safety through, for example, instantaneous numeric modelling of seismic data to monitor the stability of mines and to evacuate personnel and equipment prior to a potential event.
- Improving mineral processing through pattern recognition
- Optimising supply chains

With a projected ongoing shortfall in the supply of graduates with STEM qualifications, the AusIMM advocates for greater investment by government and the education sector to increase the quality of STEM education and the overall numbers of graduates. Such investment would underpin future innovation and growth in Australia's minerals sector.