TRANSFORMING THE MINING VALUE CHAIN

The ARC Research Hub for Transforming the Mining Value Chain will make significant improvements to industry practices along the Mining Value Chain that will enhance ore deposit discovery, mineral processing, and environmental management of waste materials.

Underpinning Technologies

This research programme will maximise data acquisition and interpretation for all stages of the Mining Value Chain, enabling mining companies to acquire this information rapidly and cost-effectively from every hole drilled at a mine site. The different data sets generated during core logging should not be invisible to each other. They should be combined in order to maximise their value. Visualisation of geology, assays and alteration allows for validation and contextualisation of data sets and verification of field logging, generating multiple layers of information that can then be draped on graphic logs and modelled in three dimensions using software such as Acquire, Leapfrog and ioGAS, using existing or future embedded linkages between these software platforms.

To integrate these disparate data sets, computational interpretation and new and existing visualisation technologies will be integrated throughout Themes 1, 2 and 3. ‘Big Data’-style computational techniques will be applied to the high-volume and high-dimensional data that will result from this research. Specific examples of such techniques are:

- Numerical and statistical element or mineral discrimination, such as streamlining the dataflow from LA-ICPMS analyses for mineral characterisation.
- Multi-dimensional micro-image analysis, interrogating the spatial distribution over multiple data layers of masses, elements and minerals.
- Spatial data analytics, probing the spatial relationships of economic and waste minerals on a deposit or mine scale – end-product outputs will be compatible with major commercial mine software packages to facilitate seamless integration between research computing insights and practical usage of the 3D outputs.

We are also undertaking innovative LA-ICPMS equipment development through collaboration with Laurin Technic. Our objective will be to build a tool that can be used for automated laser ablation analysis of drill core.

Industry Partners

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