



MONASH
University

**MINING AND RESOURCES
AT MONASH**



MONASH UNIVERSITY ACCOUNTS FOR

AUD \$5.2B

WORTH OF ANNUAL ECONOMIC
ACTIVITY IN AUSTRALIA

MONASH UNIVERSITY GENERATES

AUD \$6.60

FOR EVERY AUD \$1 OF GOVERNMENT FUNDING

IN 2016 MONASH HAD THE HIGHEST
INTERNATIONAL COMPETITIVE
RESEARCH INCOME OF ANY AUSTRALIAN
UNIVERSITY, TOTTALLING NEARLY

AUD \$79.7M

MONASH UNIVERSITY PRODUCED OVER
19,000 GRADUATES

IN 2017, OF WHICH 17,000 WERE WITHIN AUSTRALIA

MONASH AT A GLANCE

AT MONASH UNIVERSITY, THE DESIRE TO MAKE
A DIFFERENCE INFORMS EVERYTHING WE DO.

Our partnerships with government, industry and the community ensure our research and education is engaged across the entire mining value chain, from exploration to rehabilitation.

Whether it's expanding the value of the resource base, optimising existing infrastructure and operations or data analytics and drone platforms, our research is leading today's solutions to tomorrow's opportunities.

In addition to our research capabilities, our role in developing skilled graduates to support the industry and ongoing cross-disciplinary executive education are well recognised as helping to educate the employees of tomorrow.

Partnering with Monash University can take many forms and we invite you to explore our capabilities.



The Monash presence spans four continents, with locations in Australia, China, India, Italy, Malaysia, South Africa and the United Kingdom.

THE AUSTRALIAN MINING INDUSTRY AT A GLANCE

MINING-INDUSTRY ECONOMIC CONTRIBUTION

#1 GLOBAL EXPORT

AUSTRALIA IS THE WORLD'S LARGEST EXPORTER OF COAL, IRON ORE, ALUMINIUM ORES AND LEAD.

#1 FOREIGN DIRECT INVESTMENT

39% OF TOTAL INDUSTRY

AUSTRALIA'S LEADING INDUSTRY FOR FOREIGN DIRECT INVESTMENT TALLING

AUD \$310.6B IN 2016

\$236B

AUD ANNUALLY

15% OF THE AUSTRALIAN ECONOMY

AUSTRALIAN ECONOMIC CONTRIBUTION FROM MINING PLUS EQUIPMENT, TECHNOLOGY AND SERVICES (METS).

MINING-CREATING JOBS AND NEW OPPORTUNITIES

1.139M+

FULL TIME EMPLOYMENT

10% FTE MINING & METS COMBINED

240,800

DIRECTLY EMPLOYED IN MINING

60% IN REGIONAL AREAS

65,000 MANAGERS AND PROFESSIONALS EMPLOYED IN MINING

% OF PROFESSIONALS IN DIFFERENT INDUSTRIES



17.1%
MINING



13.1%
WHOLESALE TRADE



10.0%
MANUFACTURING



6.0%
TRANSPORT



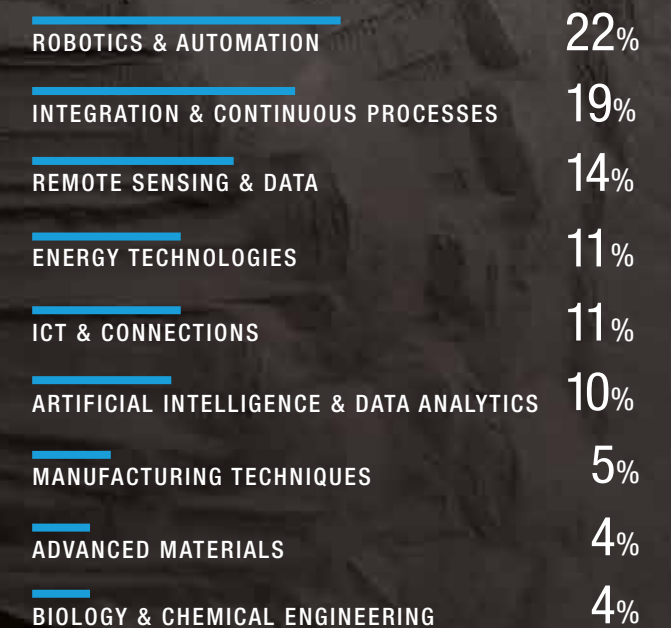
4.1%
AGRICULTURE



3.5%
CONSTRUCTION

THE NEXT DECADE AND BEYOND

HIGHLY SKILLED RESOURCES PROFESSIONALS WILL SHAPE THE FUTURE OF THE INDUSTRY THROUGH INNOVATION. IN THE NEXT 10 YEARS, THE AREAS PREDICTED TO HAVE THE BIGGEST IMPACT ON THE RESOURCES SECTOR ARE:





SINCE 2000 MONASH UNIVERSITY
IRT HAS COMPLETED OVER
**450 PROJECTS FOR MORE THAN
150 NATIONAL AND INTERNATIONAL
RAILWAY ENTITIES.**

SHAPING MINING RAILWAYS

MONASH UNIVERSITY'S INSTITUTE OF RAILWAY TECHNOLOGY (IRT) IS THE PREMIER TRACK AND VEHICLE RAILWAY RESEARCH CENTRE IN AUSTRALIA AND ENJOYS AN INTERNATIONAL REPUTATION FOR EXCELLENCE IN RAILWAY RESEARCH AND NEW TECHNOLOGY DEVELOPMENT.

IRT has assisted to transform Australian heavy haul mining railways to be the benchmark in railways. IRT is providing solutions to real problems, which are making a difference, creating greater efficiencies and ensuring safety across Australia's multi-site mining railway systems.

Since establishment as an independent business unit at Monash University in 2000, IRT has completed over 450 projects for more than 150 national and international railway entities.

IRT is one of the main technology service providers to the heavy haul mining railway operators and leading mass transit railway systems across the globe, providing a "one-stop" technology access point for the railway industry. IRT continues to look for ways to shape the future of railways, and through a greater focus on interdisciplinary research, IRT now offers an expanded capability in response to the changing nature of global railway industry needs.

Working with the network of Monash University's internationally acclaimed researchers and practitioners, a group of Rail Research Associates are assisting IRT to deliver an expanded capability using innovative technologies grouped together in key thematic areas, including automation and robotics, sensor technology and materials and performance to meet industry's current and future requirements.

AREAS OF EXPERTISE INCLUDE:

- TRACK STRUCTURE DESIGN AND MAINTENANCE
- RAIL WELDING MANAGEMENT AND IMPROVEMENTS
- VEHICLE AND TRAIN INSTRUMENTATION AND PERFORMANCE MONITORING
- COMPONENT TESTING AND QUALIFICATION
- FAILURE ANALYSIS
- WHEEL-RAIL INTERFACE DESIGN AND MANAGEMENT
- CAPACITY INCREASE
- MAINTENANCE PLANNING AND OPTIMISATION
- QUALITY CONTROL AND AUDITING
- STANDARDS DEVELOPMENT
- PROFESSIONAL TRAINING

MINING REHABILITATION

MONASH UNIVERSITY HAS EXTENSIVE CROSS-DISCIPLINARY CAPACITY TO DEVELOP STRATEGIC MINE CLOSURE AND REHABILITATION SOLUTIONS.

Monash is working in partnership with the Australian mining industry to address complex economic, social and environmental, engineering, ecological, landscape, aesthetic and sustainability issues associated with the closure and rehabilitation of mining operations.

Addressing these challenges requires a multi-disciplinary research approach to ensure that proposed solutions are technically sound, whilst meeting the needs of the community, industry and government stakeholders.

The research and training being conducted across Monash University's various faculties provide an in-depth and comprehensive expertise that can be harnessed to identify potential challenges, opportunities and solutions to mine closure and rehabilitation.

Our approach enables us to provide expertise across each component required in mine rehabilitation. It builds on the strengths of the diverse backgrounds and disciplines of staff at Monash University and translates the scientific results into practices that persistently improve the mine rehabilitation outcomes globally.

AREAS OF EXPERTISE INCLUDE:

- DEVELOPMENT OF A COST-EFFECTIVE SLOPE MONITORING FRAMEWORK
- DEVELOPMENT AND USE OF ARTIFICIAL SOILS
- DESIGN AND PERFORMANCE MONITORING OF ENGINEERED EARTHEN COVERS
- ROCK/SOIL MECHANICS
- SOIL PHYSICS AND EROSION
- SURFACE AND GROUNDWATER HYDROLOGY
- SOIL CARBON SEQUESTRATION
- GEOTECHNICAL MONITORING AND SLOPE STABILITY
- LANDSCAPE PLANNING AND REMOTE SENSING
- PLANT SCIENCES AND BIODIVERSITY
- SOCIO-CULTURAL COMMUNITY CONSULTATIONS
- GEOCHEMISTRY AND SOIL CHEMISTRY
- PROBABILISTIC APPROACHES FOR GEOTECHNICAL SITE CHARACTERISATION AND SLOPE STABILITY ANALYSIS

Location: AGL's Loy Yang mine in the Latrobe Valley, Victoria.

MONASH RESEARCHERS ARE WORKING AT AGL'S LOY YANG MINE SITE TO EXAMINE THE USE OF 'ARTIFICIAL SOILS' AND HOW THEY INTERACT WITH EARTHWORMS AND PLANTS.





MACHINE MAINTENANCE

THE MAINTENANCE TECHNOLOGY INSTITUTE (MTI) PROVIDES INNOVATIVE AND COMPREHENSIVE INDUSTRY FOCUSED RESEARCH AND DEVELOPMENT TO ACHIEVE OPTIMUM PLANT AND EQUIPMENT PERFORMANCE ACROSS THE MINING AND HEAVY ENGINEERING INDUSTRIES IN AUSTRALIA AND OVERSEAS.

MTI has developed solutions for remote data acquisition and condition monitoring using the latest in mobile data communication technology. MTI is currently monitoring more than 50 draglines, 40 excavators, one reclaimer and two stackers in Australia and overseas. All data is streamed to Monash Clayton for detailed processing and safe storage.

Embedded algorithms provide instant feedback to operators to ensure safe and optimum operation of the machine. Monthly reports provide detailed assessment of each operator's performance and information for overall management of the machine, including maintenance planning.

Detailed processing of data collected is used for a wide range of purposes including operational and production improvements; controlling undesirable loading on machines; assessment of operator performance; training of operators for maximising production while minimising damage to machines; and for providing an overview of machine performance to managers.

MTI is continuously researching to identify new and innovative ways of using continuous monitoring data to achieve operational, production, maintenance and management improvements.

MTI IS CURRENTLY MONITORING MORE THAN 50 DRAGLINES, 40 EXCAVATORS, 1 RECLAIMER AND 2 STACKERS IN AUSTRALIA AND OVERSEAS.

AREAS OF EXPERTISE INCLUDE:

- OPERATIONAL AND MAINTENANCE IMPROVEMENTS
- MONITORING OF LARGE EQUIPMENT
- IMPROVING OPERATOR PERFORMANCE
- CONDITION ASSESSMENTS
- CAPACITY IMPROVEMENTS
- LIFE EXTENSION OF AGING EQUIPMENT
- REPLACEMENT STRATEGIES
- CATASTROPHIC FAILURE INVESTIGATIONS
- NEW DESIGNS AND DESIGN REVIEWS

DRONES AND ANALYTICS FOR EXPLORATION AND MINING

OUR DRONES, ADVANCED SENSORS AND SMART ANALYTICS ARE BEING USED TO MAP SURFACES IN 3D, CHARACTERISE GEOLOGY, EXTRACT ENVIRONMENTAL INFORMATION, CAPTURE DATA OVER MULTIPLE FLIGHTS TO SEE HOW AN AREA IS CHANGING IN HIGH RESOLUTION, AND HELP WITH MONITORING INFRASTRUCTURE.

WE PROVIDE HIGH RESOLUTION MEASUREMENTS IDEAL FOR OPEN PITS, OUTCROPS AND UNDERGROUND MINES AND HAVE DEVELOPED SYSTEMS TO RAPIDLY ANALYSE LARGE DATASETS.

Our facilities are equipped with drones that fly for up to four hours and a large range of sensors, including thermal, laser range finding, digital camera, multi- and hyperspectral imaging, gas monitoring and L-band radar.

Together with these sensors we combine smart methods for analysing large datasets in order to assist with extracting the most from the data. By continually seeking to push the boundaries, we also have development projects which include drones that fly autonomously underground, drone mapping of stopes, faces, infrastructure and tunnel walls, and aeromagnetic surveys by swarms of drones.

Our Masters of Science program covers training in drones, digital mapping and data analysis. We also deliver shortcourses that equip professionals in photogrammetry and data analysis, and we run regular training that leads to pilot qualifications (CASA RePL).

Monash has one of the largest Data Science research teams in the southern hemisphere and has become one of the leading institutions in cybersecurity, block chain technology and software engineering. We lead the world in the area of immersive analytics, which addresses how we, as humans, can interact better with data.

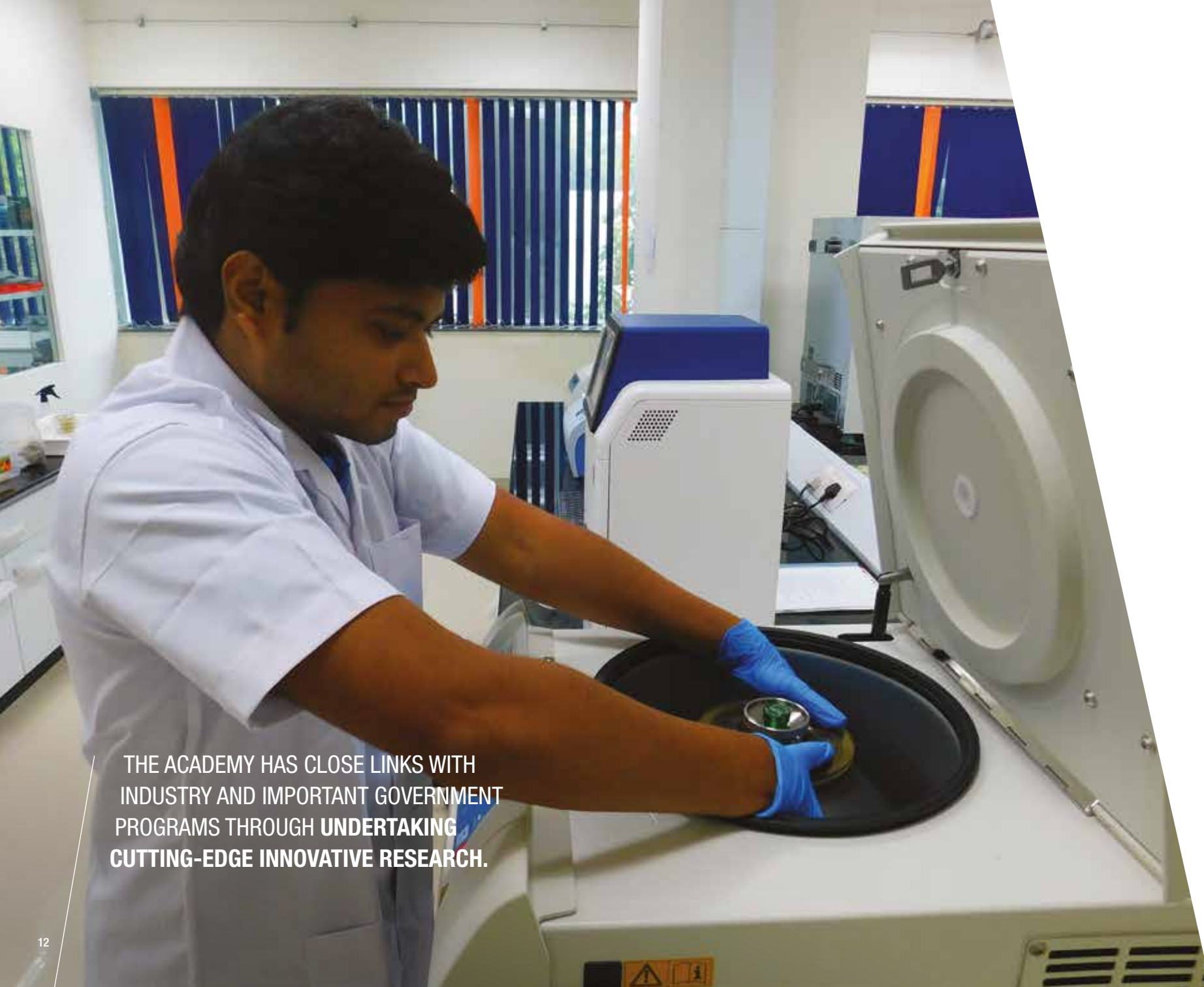
AREAS OF EXPERTISE INCLUDE:

- EXPLORATION AND MINE GEOLOGY
- PHOTOGRAMMETRY AND ANALYSIS
- IMMERSIVE ANALYTICS
- DEEP LEARNING
- PILOT TRAINING
- ENVIRONMENTAL MONITORING
- CYBERSECURITY

Using drones to inspect opencast mine



MONASH RESEARCHERS ARE BRINGING TOGETHER AI WITH LIDAR, HYPERSPECTRAL SWIR, THERMAL AND DIGITAL CAMERAS TO BRING ABOUT THE NEXT-GENERATION OF INDUSTRY OPTIMIZATION.



THE ACADEMY HAS CLOSE LINKS WITH INDUSTRY AND IMPORTANT GOVERNMENT PROGRAMS THROUGH **UNDERTAKING CUTTING-EDGE INNOVATIVE RESEARCH.**

IITB-MONASH RESEARCH ACADEMY

THE IITB-MONASH RESEARCH ACADEMY IS AN EXCITING PARTNERSHIP BETWEEN THE INDIAN INSTITUTE OF TECHNOLOGY BOMBAY (IITB), INDIA AND MONASH UNIVERSITY.

The IITB-Monash Research Academy is an independent, autonomous, not-for-profit (Section 8) joint venture research academy. It has been formed to augment the pace and intensity of research, particularly applied research, through collaborations between IITB, Monash and external industry partners.

Research is conducted through a highly innovative PhD program. Students are jointly supervised by academics from IITB and Monash, receive a joint degree from both institutions and have access to a full range of facilities at both IITB and Monash. The program features a Monash stay component where students spend a year at Monash with their local research supervisors and industry mentors.

Critical objectives of the Academy are:

- to conduct research of the highest quality;
- to contribute compellingly to economic, business, research and societal impacts;
- to train a new breed of scientific and engineering talent able to work globally with multi-national companies and R&D establishments while also contributing to the national innovation agendas of both Australia and India.

In order to achieve these objectives, it is crucial to strengthen knowledge and innovation-rich partnerships. The Academy has close links with industry and important government programs through undertaking cutting-edge innovative research.

The main benefits of a research partnership with IITB-Monash are:

- Outcomes: through high quality research publications, patents, alumni and startups.
- Talent: through the development of trained PhD scholars.
- Networks into India: through Australian and Indian academia as well as partner industries.
- Impact: to society and industry sectors through solving grand challenges in a thematic mode.

The IITB-Monash Academy operates at a scale unrivalled by any other Australian-Indian collaboration and has close to 200 PhD students, 400 researchers and 400 research projects to date. The Academy has graduated 91 students who are well placed in academia and industry including startups.

GEO-METALLURGY AND ORE PROCESSING

THE MINERALS, MICROBE AND SOLUTIONS RESEARCH GROUP (MMS) USES INNOVATIVE EXPERIMENTAL TECHNIQUES AND THEORETICAL MODELLING, IN ORDER TO STUDY A VARIETY OF PHENOMENA RELATED TO GEO-METALLURGY AND ORE PROCESSING.

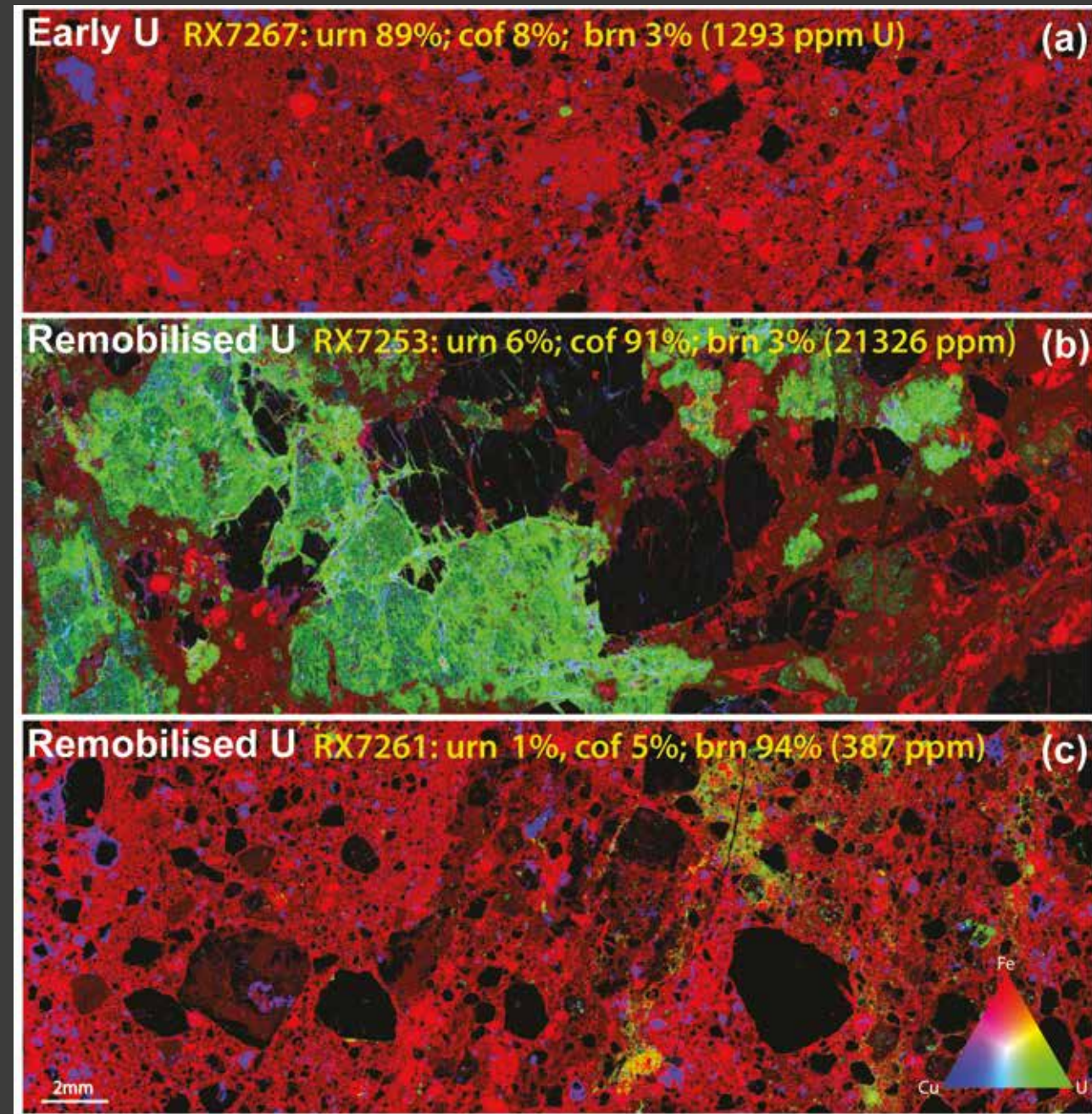
The group focusses on:

- i) fluid-rock interactions to investigate mineral replacement phenomena;
- ii) geo-microbiology of precious metals;
- iii) metal transport in hydrothermal systems; and
- iv) synchrotron geosciences.

In doing so, it provides both molecular level understanding and mechanistic information in a variety of mineral systems by investigating them in-situ in real time at conditions relevant to process industries. The insights gained are then used towards targeted large-scale applications in geo-metallurgy, ore processing and mineral exploration.

The group is part of the ARC Cu-U Transformation HUB, which focuses on harnessing the expertise and facilities of key universities in Australia to develop, test and commercialise new, safe and cost-effective methods to separate deleterious elements from Cu concentrates and enable novel IP to position Australia as a world leader in copper production and associated technology. The group also conducts research with several other industry and university partners.

SYNCHROTRON X-RAY MAPPING IDENTIFYING HOW METALS ARE MOBILE DURING DIFFERENT STAGES OF ORE FORMATION.



INTELLIGENT MINES: USING TECHNOLOGY FOR INSIGHTS, EFFICIENCIES AND SECURITY

MONASH UNIVERSITY HAS INTERNATIONALLY RECOGNISED EXPERTS LEADING RESEARCH IN THE AREAS OF DATA SCIENCE, CYBER SECURITY, COMPUTER-HUMAN INTERACTION AND ORGANISATIONAL AND SOCIAL INFORMATICS.

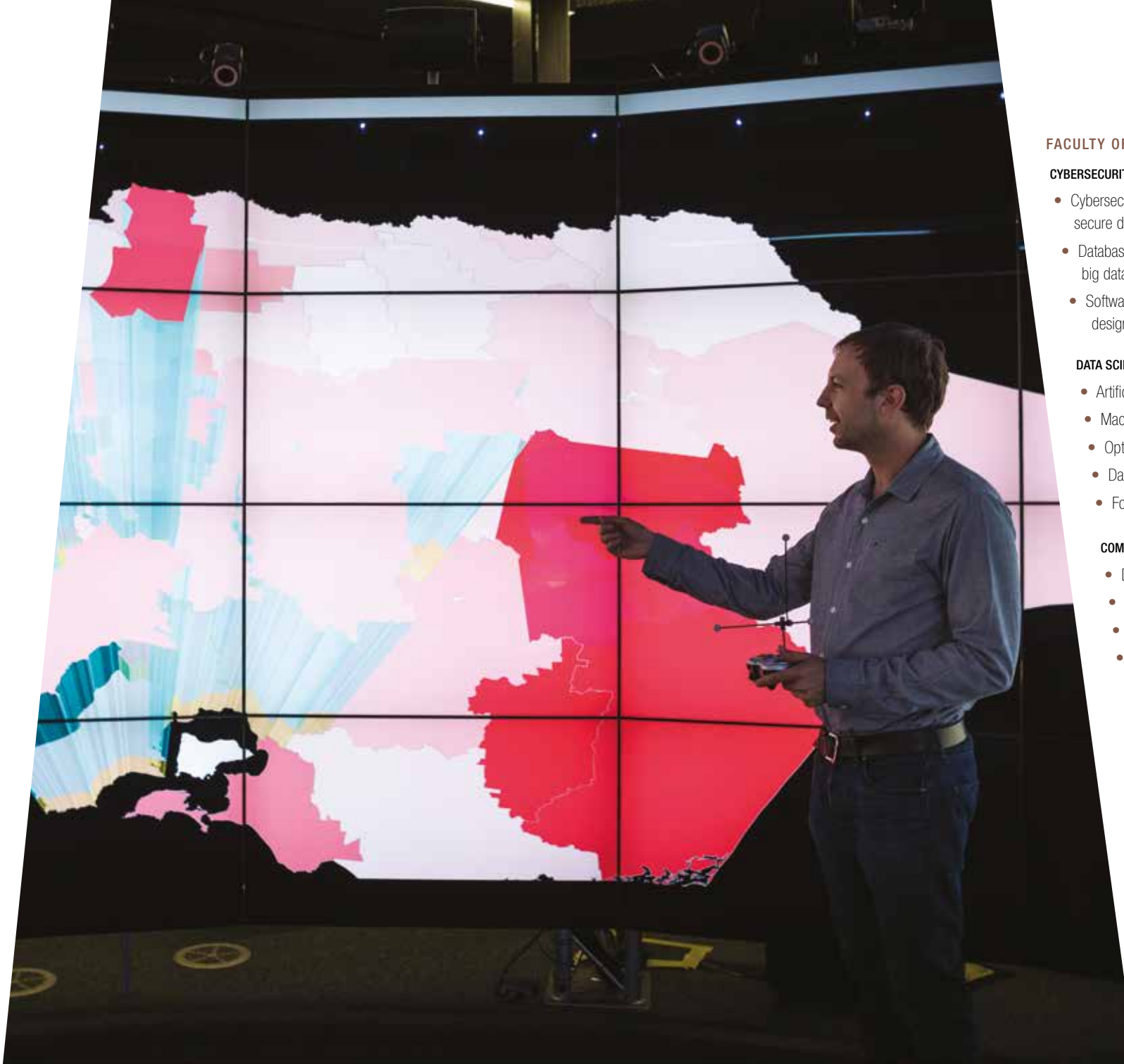
We lead Australia in the fields of software engineering, optimisation and block-chain research and have the largest group of data scientists of any research institute in the Asia-Pacific region.

From forecasting to maximising machine availability, through to optimising dragline operations and predictive maintenance of mining machines, our Data Science research team is experienced in providing insights and improving efficiency of mining operations. There is a significant opportunity for predictive maintenance and less downtime by using IoT-enabled equipment and creating statistics-based predictive analytics tools to estimate the probability of expensive failures before they happen.

While cybersecurity is obviously fundamental to guarantee security and safety of current and future mining operations, recent developments have the potential to change the way resources systems are built, and require an adapted view on resilience and security.

Research at Monash University focuses on building a rigorous technical basis through the development of advanced cryptographic algorithms with provable security properties and inter-disciplinary research that validates new approaches in the context of threats and risks within particular application domains.

An immersive 2D/3D virtual reality environment



FACULTY OF IT RESEARCH CAPABILITIES

CYBERSECURITY & SYSTEMS

- Cybersecurity: block chain technology, secure data storage in the cloud
- Database systems: Internet of Things (IoT), big data, spatial databases
- Software systems: software engineering, design, testing and validation

DATA SCIENCE

- Artificial Intelligence
- Machine Learning
- Optimisation
- Data Analytics
- Forecasting

COMPUTER HUMAN INTERACTION & CREATIVITY

- Data visualisation
- Computational creativity
- Assistive technologies
- Human-centred mobile and multimodal-multisensor interfaces
- Immersive analytics and applications of virtual and augmented reality
- Human-centred Artificial Intelligence

ORGANISATIONAL & SOCIAL INFORMATICS

- Archives and recordkeeping
- Digital transformation
- ICT for socio-economic empowerment and healthcare
- Decision support

3D GEOLOGICAL MODELLING AND UNCERTAINTY REDUCTION - THE LOOP PROJECT

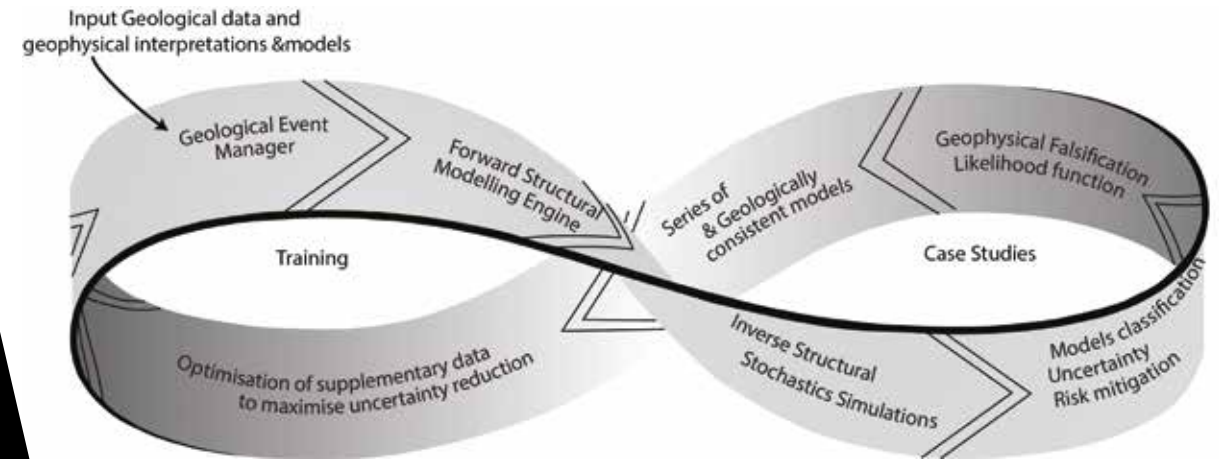
MONASH UNIVERSITY IS DEVELOPING TECHNOLOGIES TO MITIGATE 3D GEOLOGICAL RISK IN RESOURCE MANAGEMENT.

The Loop Geoscience project is developing technologies to mitigate 3D geological risk in both exploration and resources management through the innovative application of mathematical methods, structural geology concepts and cutting-edge probabilistic programming.

The outcomes will fundamentally improve our understanding of 3D geological modelling capability and the outcome will be an open 3D modelling platform available to the public, industry and decision makers.

These new methods will enable 3D geological modelling in all types of geological environments from urban geology, to basins to polydeformed metamorphic terranes as well as assessing and mitigating geological uncertainty. These will provide enhanced capability to model the subsurface, characterise model uncertainty and test multiple geological scenarios.

These enhanced capabilities are extremely important for the future of Australia's subsurface management, including urban geology and our continuously growing sustainable resources industry (including water) and will facilitate decision making for government organisations as well as the resources industries.



LOOP WORKFLOW:

an open source 3D probabilistic geological modelling platform to mitigate 3D geological uncertainty. The platform will integrate field geological data with geophysical modelling to generate consistent 3D models from the mine scale to the plate scale and including geological problems, related to resources exploration and management in urban geology settings, basins geology environments and poly-deformed metamorphic terranes.

EXPLORATION

OUR TEAM WORKS ACROSS MULTIPLE SCALES OF THE MINERAL SYSTEM TO ASSIST WITH EVERYTHING FROM PROJECT GENERATION AND DEPOSIT DISCOVERY TO NEAR MINE RESOURCES IN GREENFIELDS, MATURE TERRANES AND UNDER COVER ENVIRONMENTS.

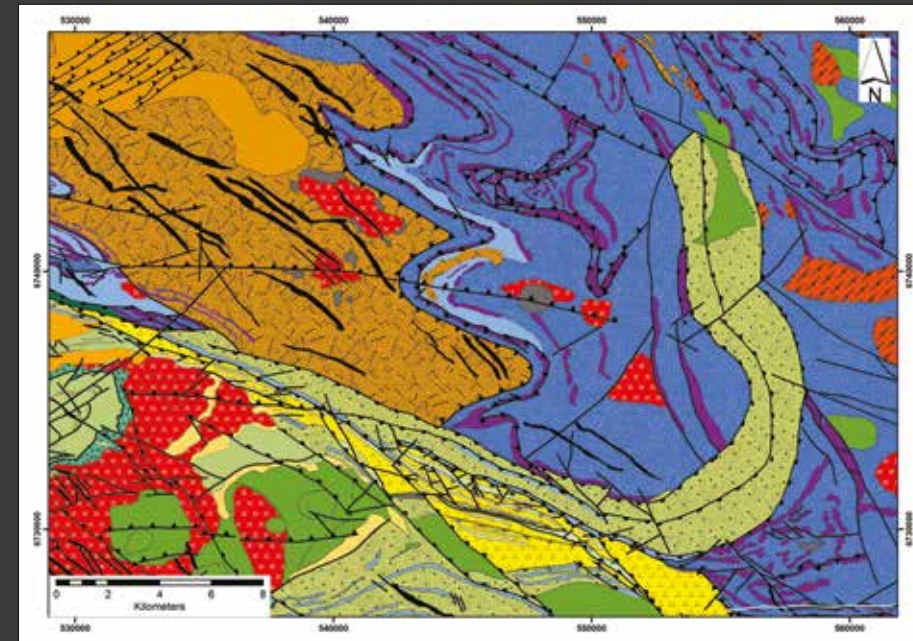
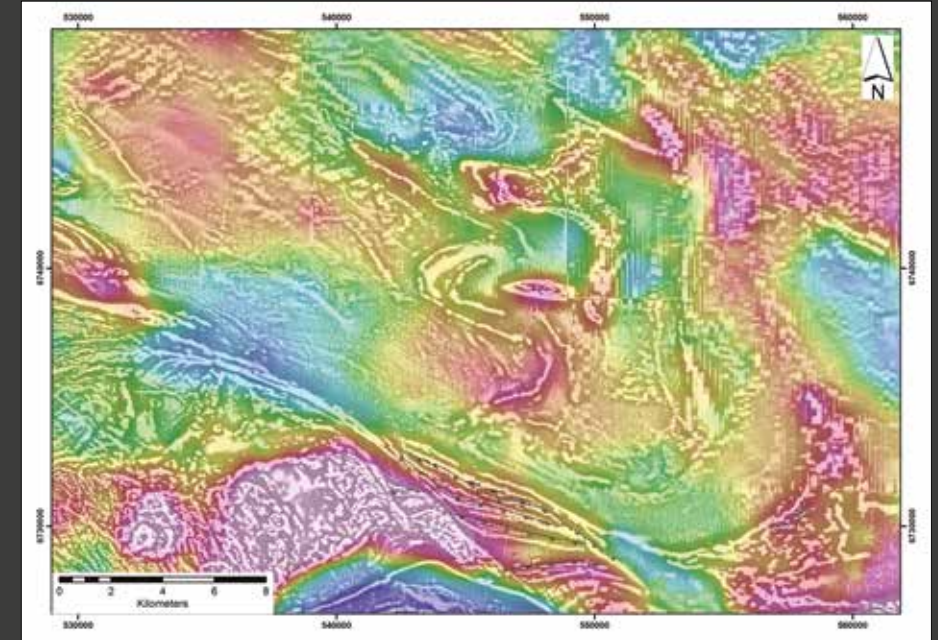
We combine structural geology, tectonics, geodynamic modelling, metamorphic and igneous petrology, geochronology and isotope geochemistry to understand where fluids, magmas and metals are sourced from, their principal pathways through the crust and how they concentrate. Our structural geology and geology-from-geophysics interpretation teams are the largest in Australia. We have particular strengths in novel predictive techniques, 3-D visualisation of data and the application of drone sensing with analysis tools.

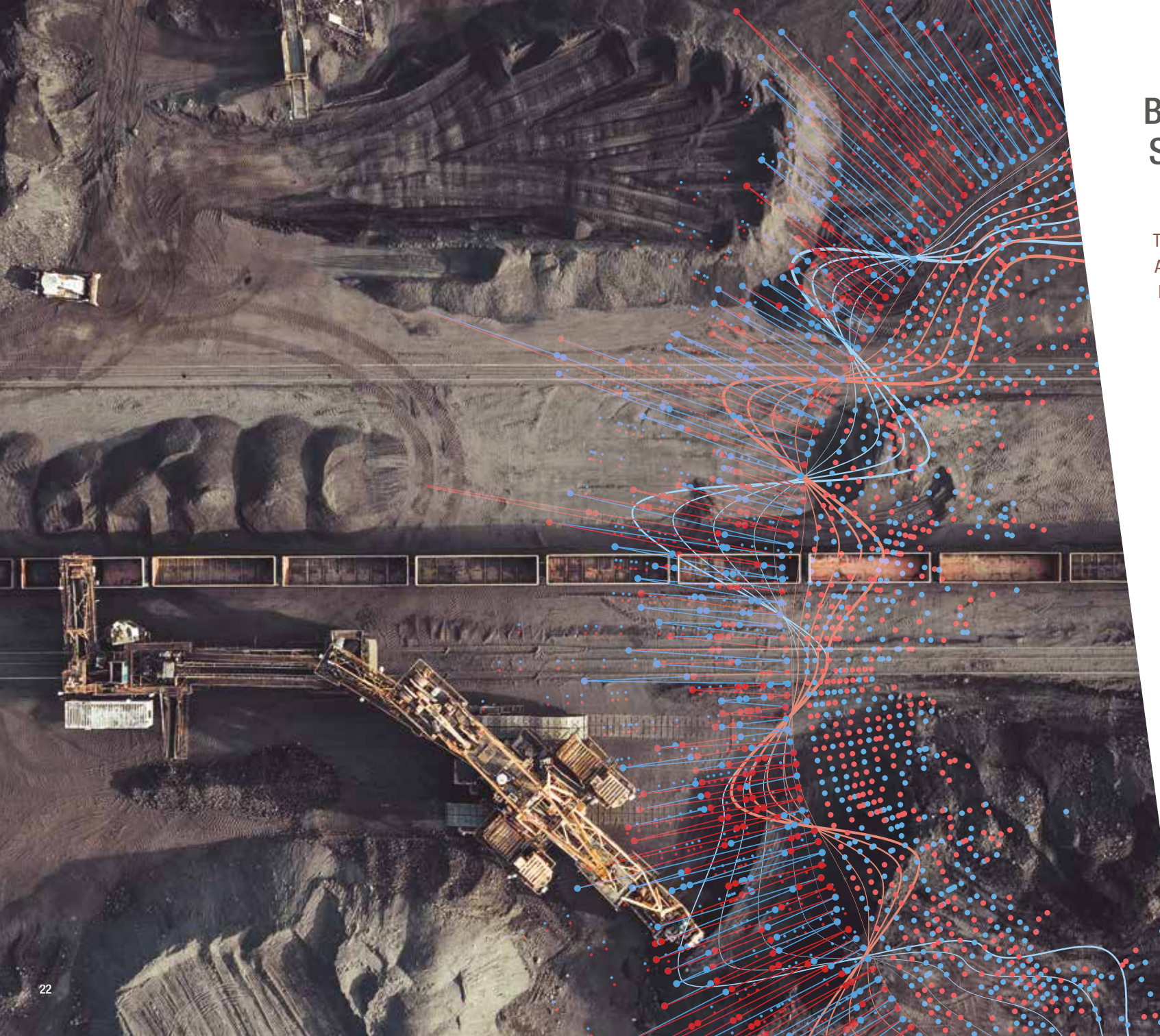
Our experience ranges across all the precious, critical and base metal commodities (iron, copper, gold, lead, zinc, rare earth elements, nickel etc). We provide research projects, professional training and consultancies, and we have one of the largest undergraduate intakes in the country for Earth Science departments. We also deliver a novel Masters of Science program designed to make students ready for the industry of the future which takes students from project generation through to discovery, and includes content on digital mapping, application of drones, remote sensing, geophysical modelling, 3-D visualisation and applied geochemistry.

Our team works across multiple scales of the mineral system to assist with everything from project generation and deposit discovery to near mine resources in greenfields, mature terranes and under cover environments.

These enhanced capabilities are extremely important for the future of Australia's subsurface management, including urban geology and our continuously growing sustainable resources industry (including water) and will facilitate decision making for government organisations as well as the resources industries.

A geophysical interpretation of complex geology using integrated aeromagnetics and high resolution gravity data





BUSINESS MODELS FOR A SUSTAINABLE MINING SECTOR

THE MONASH BUSINESS SCHOOL'S RELATIONSHIP WITH THE MINING SECTOR IS ENTERING AN EXCITING NEW PERIOD AS COMPANIES EXPERIMENT WITH NEW BUSINESS MODELS IN EXPLORATION, PRODUCTION MARKETING AND SERVICES.

In practice this means that many of the industry's capabilities, which were staples for the industry for decades, have been and will continue to be superseded as new approaches emerge. New techniques developed for other industries, such as manufacturing and even retail, will contribute to this period of disruption. And our capabilities, for example, in big data analytics have contributions to make in forecasting and process optimisation.

It is at the business model-technology interface that some of the most exciting developments are taking place. For example, we have expertise in applying social network theory to value chains in the mining industry and have explored the impact of economic and organizational changes on network strategies in the Diamond industry. With this knowledge it is possible to alter collaborative orientations and advance value co-creation in buyer-seller relationships that facilitates the deployment of new technology.

Reporting regulations, internal control disclosures, earnings quality, auditing, cost of capital and valuation of listed companies are areas where we have expertise that can aid investment decisions. Our 'in-context' approach to taxation law research means that we understand the impact that taxation policy and reform plays in shaping the commercial opportunities for mining companies and the communities they serve. These empirical approaches consider social, economic or historical impact in shaping the 'licence to operate'. Our extensive experience in natural resources taxation, including resource rent taxes and royalties, is available for our partners to draw on.

Though our work with the AusIMM and our colleagues in other Monash faculties we have contributed to the debate, through masterclasses and articles, on the future of work in the resources sector. We are looking for partnerships with companies to explore these questions further. Monash Business School has trained large numbers of mining executives in management, accounting, finance, economics, marketing, business law and taxation and continues to be a major source of graduate and post-graduate talent.

OUR TALENT

MONASH IS FULLY COMMITTED TO INCREASING THE NUMBERS OF WOMEN STUDYING AND WORKING IN SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS. OUR FEMALE STUDENTS ARE SUPPORTED WITH A RANGE OF INITIATIVES TO FOSTER THEIR SKILLS, CONFIDENCE AND CAPABILITIES.

Ranked in the top 1% of world universities, and consistently rated as a preferred university from which to hire graduates, Monash delivers an enviable pipeline of talent to the resources industry.

With Australia's number one Engineering school including a resources engineering specialisation, plus world-class Science, Information Technology, Arts, and Business faculties, Monash University's highly regarded graduates are well prepared to meet the challenges of the future in the resources field.

Our resources engineering specialisation allows students to gain expertise across the fields of mining, geological, oil and gas, materials and renewable energy engineering. With critical skill sets in automation and digital technologies, data science, analytics, exploration, planning, extraction, processing, rehabilitation and environmental sustainability and biology, Monash graduates are in high demand and rapidly employed across the sector.

Our geoscience specialisations allow students to gain experience in the Structural Geology, Structural Geophysical interpretation and modelling, 3D modelling, mineral system analysis, drone application for mining and exploration, radiogenic isotope analysis, and broad ranging economic geology applications including hydrothermal reaction and transport, bio-mineralogy, synchrotron geoscience, volcanology, environmental geoscience and hydrogeology.

Our students are training in data analysis and technologies that relate to the mineral exploration, mining, and the environment. Our graduates are employed across mining, exploration, government and consults.

Keely Simpson-Bull, Bachelor of Mining Engineering (Honours) and 2018 winner of the Sir Frank Espie / Rio Tinto Award from the AusIMM Education Endowment Fund stated, "I chose mining engineering because mining is something that affects everybody's life. Without mining, the metals and materials needed to develop new technology wouldn't exist – materials such as lithium for batteries, and particular metals needed for computers and phones (to name a few). I'm excited to be a part of something so important, and to be a part of developing new ways to make mining cleaner and safer."

I'M EXCITED TO BE PART OF SOMETHING SO IMPORTANT, AND TO BE PART OF DEVELOPING NEW WAYS TO MAKE MINING CLEANER AND SAFER.

KEELY SIMPSON-BULL

Bachelor of Mining Engineering (Honours)
and 2018 winner of the Sir Frank Espie / Rio Tinto Award
from the AusIMM Education Endowment Fund.





PARTNERING WITH MONASH FOR SOCIAL IMPACT

SUCCESSFUL BUSINESSES IN THE RESOURCES SECTOR RELY ON MORE THAN COMPETITIVE ADVANTAGE TO THRIVE IN THE 21ST CENTURY - IT IS THE FIRM DEDICATION TO POSITIVE SOCIAL CHANGE THAT ENABLES THEM TO LEAD IN THE MARKETPLACE.

Key players in the sector are advancing their chosen social purpose through Corporate Philanthropy, effectively enhancing their operating environment whilst creating a virtuous circle of social improvements and economic benefits.

Delivering across many disciplines, Monash brings a holistic, multifaceted and novel approach to help our corporate partners in the resources field to achieve their ambitions. Together we find short and long-term solutions to enable lasting positive change - for a more sustainable, ethical, safe, diverse and innovative future.

All philanthropic projects through Monash enjoy the same rigorous measurement and management as any other grant-funded program. We commit all philanthropic funding directly to the project and co-invest the administrative costs ourselves. By getting the detail of our partnership right, we ensure the most beneficial intersection of investment, impact and improved conditions to unlock your philanthropy's maximum potential.

If you are interested in establishing a transformational partnership with Monash, please contact us.

THE MONASH PRECINCT

MONASH UNIVERSITY IS AT THE EPICENTRE OF THE INNOVATION CLUSTER LOCATED IN CLAYTON, IN MELBOURNE'S SOUTH-EAST. THE AUSTRALIAN SYNCHROTRON, THE MELBOURNE CENTRE FOR NANOFABRICATION, THE FEDERAL GOVERNMENT AGENCY FOR SCIENTIFIC RESEARCH IN AUSTRALIA (CSIRO) AND THE MONASH HEALTH HOSPITAL ALL LIE WITHIN A THREE-KILOMETRE RADIUS OF AUSTRALIA'S LARGEST UNIVERSITY.

This precinct is world class and delivers impact globally – contributing to productivity, prosperity and the betterment of communities locally and internationally. Our industry-partnered precinct translates discovery into tangible outcomes in areas ranging from next generation pharmaceutical products and medical therapeutics to automated machines and robotics.

The collaborative environment, underpinned with a unique integrated network of infrastructure, enables the precinct partners to push the limits of computing, imaging and materials. The precinct means that we attract the highest calibre students – because they get to work and learn alongside world-leading researchers and international industry partners such as Agilent Technologies, BHP Billiton, Bosch Australia, Janssen, Johnson & Johnson, Lockheed Martin, Pfizer and Woodside.

Contact us to be part of this vibrant R&D community.

Innovation

Woodside

THE MONASH PRECINCT **CONTRIBUTES**

AUD \$9.4B

TO THE VICTORIAN ECONOMY EACH YEAR*

THE MONASH PRECINCT **SUPPORTS** OVER

13,000 BUSINESSES

AND **EMPLOYS MORE THAN**

82,000 PEOPLE

* Based on Gross Regional Product per Worker for the Monash, Kingston and Dandenong regions, as reported by the Victorian Planning Authority (2017)

Monash University is proud to have long-standing research and education collaborations with a broad range of leading resources companies and organisations, including:

AGL LOY YANG MINE

ANGLO COAL

AUSIMM

BORAL LIMITED

BHP

FORTESCUE METALS GROUP

HOLCIM AUSTRALIA PTY LTD

KAROON GAS AUSTRALIA LTD

MMG

NEWCREST MINING

ORICA

RIO TINTO

ROY HILL

WOODSIDE ENERGY

CONTACT DETAILS

Office of the Deputy Vice-Chancellor
and Vice-President (Enterprise)

Monash University
34 Exhibition Walk, Clayton campus
Clayton, VIC 3800
Australia

E: miningandresources@monash.edu
T: + 61 3 9905 6161

monash.edu/industry/mining-resources

