School of Geosciences

www.geosci.monash.edu.au

MONASH University
Science

GROUP OF EIGHT

About the School of Geosciences

The **School of Geosciences** at Monash University has research programs and delivers courses covering the entire range of Earth sciences, including: petrology, volcanology, tectonics, palaeontology, sedimentology, economic geology, geodynamics, geophysics, hydrogeology, and environmental geoscience. The School of Geosciences is an integral part of the Faculty of Science and has several joint research and teaching initiatives with the School of Chemistry, the School of Geography and Environmental Science and the Faculty of Engineering.

Research facilities

The School of Geosciences has a range of state-of-the-art research facilities. These form part of a larger network of facilities within the Victorian Institute of Earth and Planetary Sciences (VIEPS), including:

- Fully automated stable isotope facility (C, H, N, O, S)
- High Resolution ICP-MS
- Quadrapole ICP-MS with laser ablation
- Time of Flight ICP-MS with laser ablation
- Ion chromatography
- Fluid inclusions
- Piston cylinder experimental facilities
- Class 100 clean laboratory

- Geophysical instrumentation development laboratory
- Hydrochemistry laboratory
- Petrographic preparation facility
- Rock crushing and mineral separation facility
- High performance computer modelling and network.

Key research strengths

- Geodynamics, volcanology and ore deposits
- Geospatial imaging and environmental geoscience
- Geophysical methods and analysis
- Palaeobiology and basin studies through Earth history

The School offers research programs across a wide range of Earth sciences. We are consistently rated as one of the most successful Geoscience departments in Australia, and have a large and vibrant research community of academic staff, research staff, and postgraduate students. We have active collaborations with other universities within Australia and overseas, research institutions such as CSIRO, industry, and state and federal government agencies. Research in the School of Geosciences is concentrated into a number of groups, including: Tectonics, Volcanology and Igneous Geochemistry, Ore Deposits, Environmental Geosciences and Hydrogeology, Geophysics, and Palaeontology. The “Geodynamics of the Australian Plate” (GAP) Research Centre commenced activity in 2008.

Academic staff and their research interests

Dr Laurent Ailleres

3D geological modelling; 3D property modelling; 3D structural geophysics; geophysical signature of ore deposits; 3D potential field inversions.

Professor Mike Asten

Passive seismic methods for geotechnical engineering applications. Electromagnetic methods for mineral exploration. Electromagnetic methods for unexploded ordnance detection.

Dr Graeme Beardsmore

Geothermal resource identification and characterisation; heat flow measurement and modelling.

Dr Peter Betts

Precambrian tectonics and supercontinent reconstruction, crustal architecture from an integrated geology and geophysical perspective, structural geophysics.

Mr Barrie Bolton

Environmental management, geochemistry, sedimentology, economic geology.

Associate Professor Ian Cartwright

Groundwater geochemistry; surface water geochemistry; large-scale groundwater resources; hydrogeology; salinity; applications of stable isotopes to environmental processes.

Professor Ray Cas (Head of School)

Physical volcanology; eruption processes and hazards; geology of volcanic hosted mineral deposits, including diamonds, nickel sulphide, volcanic massive sulphide deposits; epithermal mineral deposits; sedimentology.

Professor James Cull

Exploration, engineering and environmental geophysics; application of EM techniques for high-definition near-surface mapping; groundwater and mineral exploration; geothermal and magnetotelluric methods for crustal studies.

Professor Mike Hall

Origin and evolution of sedimentary basins – how they form, how they fill and how they deform; involves structural geology, stratigraphy, sedimentology, well log analysis and geophysics, especially reflection seismology and basin analysis.

Professor Reid Keays

Magmatic ore deposits, geochemistry of the mantle, ultrabasic and basic rocks.

Dr Duncan Massie

Application of geophysical equipment, data reduction and processing algorithms to resolving near-surface geo-electrical structures. This has particular application in the geotechnical and environmental fields where groundwater contamination from urban infrastructure is becoming increasingly common.

Associate Professor Louis Moresi

Plate tectonics; rheology of the lithosphere; thick-skin continental deformation; extensional basin models; computational solid and fluid mechanics.

Dr Ian Nicholls

Petrology/geochemistry/volcanology of igneous rocks, especially island arc volcanic rocks (Indonesia); SE Australian Mesozoic-recent basaltic rocks; SE Australian Palaeozoic (Lachlan Fold Belt) granites; single mineral analytical techniques.

Professor Patricia Rich

Climate and biotic change through time – Precambrian to recent. Special interest in late Mesozoic and Neoproterozoic times of significant global change.

Dr Wouter Schellart

Analogue experiments and geodynamic modelling of plate tectonic processes, especially subduction processes.

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Dr Rick Squire

Understanding the structural and stratigraphic architecture of the rocks hosting world-class ore deposits with a view to integrating the links between tectonic and metallogenic evolution.

Dr Jeffrey Stilwell

Invertebrate and micropalaeontology; applied biostratigraphy; basin analysis; palaeo climatology.

Dr Andrew Tomkins

Economic geology and geochemistry; metamorphic and igneous petrology; structural geology; multi-technique geochronology; core-mantle-crust interactions and the geodynamo; planetary science; impact geology and hydrothermal systems; palaeotectonics.

Associate Professor Roberto Weinberg

Magma segregation and transport; magma mingling/mixing and porphyry copper deposits; continental extension; heat flow; core complexes and continental break-up.

Dr Heather Wright

Magma ascent and vesiculation processes, concentrating on silicic magma compositions; Emplacement of silicic magmatic deposits.

Find out more about the School of Geosciences

Visit us on the web at

www.geosci.monash.edu.au

Ask us a question

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Drop in and see us

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