

# PhD Scholarship: Three-dimensional architecture and petrophysical properties of buried volcanic systems

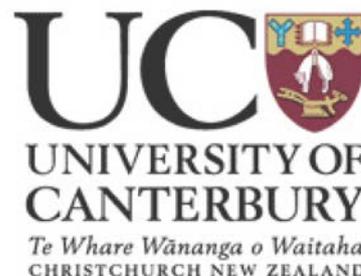
**Closing Date for Applications:** 01/12/2017

**University:** Department of Geological Sciences, University of Canterbury, Christchurch, New Zealand

**Stipend:** \$NZ25,000 p.a. plus fees (presently ~\$NZ7,200)

**Post Duration:** 3 years starting 2018

**Supervision:** Ben Kennedy (Principal Supervisor), Darren Gravley, Andy Nicol, Marlene Villeneuve and Alan Bischoff



## Project Summary

This scholarship is part of the Research Project “Potential to Discovery Hydrocarbons Associated with Buried Volcanoes” funded by 2017 Endeavour Fund - Smart Ideas, MBIE New Zealand. This project will investigate the three-dimensional geometry and petrophysical properties (e.g. porosity and permeability) of buried volcanic systems and their surrounding sedimentary strata. Understanding the architecture and petrophysical properties of volcanic and sedimentary systems is critical for developing fluid-flow migration and accumulation models that can be applied in petroleum and geothermal exploration. Open-file 2D and 3D seismic reflection surveys, petroleum and geothermal exploration wells from NZ sedimentary basins and Taupo Volcanic Zone, together with outcropping active and extinct volcanoes (e.g. Mt Taranaki, Mt Tongariro, Banks Peninsula, and Oamaru volcanoes), will be used to develop empirical fluid-flow migration models for volcanoes. The results will have generic implications of global application and will place the student in a strong position to work within the energy industry and conduct further research.

## Key Duties and Responsibilities

- To undertake field and geotechnical mapping (including the use of drones and SfM) to investigate and visualize the three-dimensional architecture of volcanic and sedimentary deposits that comprises volcanic systems, including size, geometry, vertical and lateral distribution and architectural elements.
- To undertake research on petrophysical properties of volcanic and enclosing sedimentary rocks, in the laboratory and field, defining how permeability and porosity vary in different architectural elements.
- To integrate and maintain the petrophysical dataset from this project into the wider project.
- To be member of a research group focusing on GeoEnergy resources and physical volcanology, working closely with Canterbury University staff and post-graduate students.
- To actively engage in the dissemination of the research results, in particular the preparation and submission of research papers to high impact international journals, and reports.

## Preferred Candidate Requirements

- BSc (Hons) or MSc with First Class Honours or with equivalent high GPA in geology with emphasis in volcanology and/or rock mechanics.
- Experience in mapping and textural description of volcanic rocks.
- Experience in laboratory analysis of petrophysical properties of rocks.
- A high standard of written and spoken English. Applicants for whom English is not their first language, or who have not undertaken their degree studies with English as the language of instruction, must attain a satisfactory English language test score (TOEFL or IELTS) before they will be able to meet enrolment requirements at the University of Canterbury.

## Applications for this PhD Scholarship:

Interested applicants should submit a detailed CV, including an academic transcript, a letter detailing their interest and suitability for this project with reference to the preferred candidate requirements, and the names and contact details of two academic referees. For more information on the department see [www.geol.canterbury.ac.nz](http://www.geol.canterbury.ac.nz). All applications and further enquiries regarding this project should be directed to Alan Bischoff ([alan.bischoff@pg.canterbury.ac.nz](mailto:alan.bischoff@pg.canterbury.ac.nz)) or Ben Kennedy ([ben.kennedy@canterbury.ac.nz](mailto:ben.kennedy@canterbury.ac.nz)).

**The application deadline is** 1<sup>st</sup> of December 2017. The successful applicant may commence the project immediately following this, subject to study visa requirements. Expected starting date is 1<sup>st</sup> of February 2018.