

The School of Geography, Geology and Environmental Science at the University of Auckland, New Zealand, invites applications from outstanding students to fill three fully-funded 3-yr PhD positions to study the Auckland Volcanic Field, North Island, New Zealand. These PhD research projects form key components of a major, multi-year integrated research programme with the long-term aim of determining volcanic risk in Auckland.

The Auckland Volcanic Field is a small-scale monogenetic intra-plate basaltic system that has produced about 50 small centres in the form of tuff rings, maars, cinder cones and associated lava flows during its estimated 250 kyr lifetime. The most recent eruption was about 700 years ago, and the field is still considered potentially active.

PhD projects available:

1. Petrology of the Auckland Volcanic Field (AVF)

The volcanology, mineralogy and geochemistry of the AVF has been generally described and this project will focus on detailed studies (mineral chemistry, melt inclusions, isotopes, trace element modelling) which will lead to an understanding of how the mantle yields small scale melts and how these melts become modified during their rise to the surface. The successful applicant will have an interest in volcanic rocks, mineralogy and geochemistry; an ability to apply mathematical models will be an advantage. He or she will be expected to work closely with the PhD candidate working on the complementary project investigating physical controls of monogenetic volcanism.

Research team: Ian Smith (ie.smith@auckland.ac.nz), Colin Wilson, Steve Blake, Jan Lindsay

2. Physical controls on monogenetic basaltic volcanism

This project focuses on developing a quantitative understanding of the physical controls on monogenetic basaltic volcanism. The focus will be on the Auckland Volcanic Field, but suitable ancient analogues will also be targeted. The successful candidate will undertake field investigations to improve the current structural and tectonic model for the Auckland volcanic Field, and determine the relationship, if any, between tectonics and volcanism in this region. From a strong foundation in field observation, the candidate will formulate models for the transport of magma through the crust and test these using numerical simulations. This project provides an opportunity to produce innovative insights into how monogenetic volcanism evolves and varies in both time and space. Applicants for this PhD project should have a strong foundation in structural geology, tectonics and volcanology, and a high level of numeracy. The successful applicant will be expected to work closely with the PhD candidate working on the complementary project investigating the petrology of the Auckland Volcanic Field.

Research team: Julie Rowland (j.rowland@auckland.ac.nz), Colin Wilson, Steve Blake

3. Quaternary crypto-tephra study of sediments in Auckland maars

Auckland Volcanic Field maars contain excellent sequences of laminated lake sediments with numerous tephra layers from local and distant volcanoes, spanning the last 50,000 years. A candidate is needed to construct a tephrostratigraphic record of ash fall based on crypto-tephra (microscopic ash) layers. The purpose is to assess the past frequency and sources of ash fall in Auckland for hazard analysis. The project will involve the extraction and geochemical analysis of glass shards from sediment cores. A background in lake sediment cores; micro-geochemical analysis or tephra studies could be an advantage, but is not required.

Research Team: Phil Shane (pa.shane@auckland.ac.nz), Paul Augustinus, Graham Leonard, Jan Lindsay

General information

Each PhD position includes a 3-year stipend of NZ \$25,000 per annum (tax free), university fees and research costs (including field and analytical costs, and travel to national and international conferences). Applicants should provide a CV and include contact details of 2-3 referees and a short letter of motivation and research skills. Applications due by 30 June 2008 with an expected start date by December 08.

Applications should be emailed to Jan Lindsay: j.lindsay@auckland.ac.nz

For specific information on each project contact the relevant team leader. For general information contact Jan Lindsay.