



PhD students are sought to work on several seismological and geophysical topics within the Institute of Geophysics, School of Geography, Environment, and Earth Sciences, Victoria University of Wellington (VUW). The geophysics group at Victoria University of Wellington has an established track record of research in seismology, tectonics, crustal geophysics, and structural geology. In the most recent Performance-Based Research Fund (PBRF) evaluation, Victoria University of Wellington was ranked first in New Zealand for research excellence and was also ranked first in New Zealand in Earth Sciences.

1. **Deep Fault Drilling Project, Alpine Fault** — several studies addressing the structure and evolution of the Alpine Fault in the South Island are underway, including analysis of data collected in shallow boreholes drilled into the fault in early 2011. Plans are now underway for a deeper borehole targeting the fault at 1.0 km depth (scheduled to commence in October 2014), and students interested in working on the microstructural, seismological, or pressure-/temperature-monitoring data from the boreholes are encouraged to contact us. Additionally, one PhD and one MSc scholarship focussed on Alpine Fault seismicity have been funded: details are available at <http://tinyurl.com/AlpineFault-PhD> and <http://tinyurl.com/AlpineFault-MSc>.
2. **Structure of the Hikurangi subduction margin beneath Wellington** — an international consortium of researchers in New Zealand, the US and Japan has been studying this problem for several years using active and passive seismic methods (the SAHKE experiment). The recent earthquake sequence in Cook Strait and the northern South Island will provide a new set of data for a PhD student to use to accompany the earlier data to compare structures along the strike of the plate with those across the plate boundary. We are particularly interested in the properties of the plate boundary and how they relate to nearby areas of slow slip and to earthquake occurrence patterns.
3. **Volcano seismology** — we are continuing to develop techniques to test whether time varying seismic properties such as isotropic velocity, anisotropy and attenuation can be used to determine changes in the

magmatic system underneath volcanoes. Volcanoes in New Zealand and overseas are being targeted.

4. **Seismological studies of geothermal areas** — in collaboration with Mighty River Power, a large electricity generator, we are developing projects focussed on seismicity and structure around geothermal fields in New Zealand. PhD projects of particular interest include: a) microearthquake characterization of geothermal fields in New Zealand; b) ambient noise imaging of geothermal areas of New Zealand; c) petrophysical characterisation through seismic wave propagation.

5. **Statistics and geophysics** — students will work on statistical methods of developing and testing methods for determining properties of interest to geophysicists, for example, automatic determination of S arrival times, seismic anisotropy, and earthquake focal mechanisms.

6. **Seismicity and Tectonics of southern South Island, New Zealand--** Deformation in southern South Island, New Zealand, has long been thought to be almost entirely focused offshore, along the southern extension of the Alpine Fault and Puysegur subduction zone. However, the thick crust and lithosphere farther east in Central Otago, together with widespread seismicity and geological evidence for young regional uplift, suggest deformation is much more widespread, particularly at deeper levels in the lithosphere. This PhD will take over the running over a newly installed micro-earthquake array as a tool to investigate the tectonics of this region. The study has the potential to integrate many aspects of Cenozoic tectonics right across the southern part of the New Zealand plate-boundary, from the active margin of Fiordland to the continental platform around Dunedin.

7. **Regional tectonic evolution and structure of the offshore Zealandia continent**, including Gondwana rifting and Tonga-Kermadec subduction initiation. A large dataset of offshore seismic-reflection data has been compiled and new voyages are planned. Students are sought with an interest in the manipulation and interpretation of seismic-reflection, gravity, and magnetic data.

The next deadline for PhD scholarship applications is 1 **November 2014 in New Zealand (31 October on the other side of the dateline)** and the application is free of charge:

successful scholarship applicants from any country receive a NZ\$23,500 stipend and all tuition fee payments. Students should have completed an MSc degree prior to commencing study. Full details regarding the application process are available from the Faculty of Graduate Research at <http://tinyurl.com/VUW-FGR>. (Note that the eligibility conditions and award level of the Alpine Fault MSc scholarship referred to above are different; the webpage provides full details.)

All prospective applicants should contact Professor Martha Savage (martha.savage@vuw.ac.nz) at the earliest opportunity for further details regarding these projects.

Martha Savage
Professor of Geophysics
SGEES
Victoria University of Wellington
Te Whare Wananga o te Upoko o te Ika a Maui

Temporary office: MY 1114
Box 600, Wellington, 6140
New Zealand

Email: Martha.Savage@vuw.ac.nz
DDI: +64 (0)4 463-5961
mobile: 021-262-7516