PhD Scholarship

New Zealand: Development of seismology-based volcano monitoring techniques

Victoria University of Wellington

We seek a highly motivated student for a 3-year PhD scholarship. This is part of a wider "volcanism theme" with the ultimate aim to produce short-term forecasts and long-term probabilistic hazard estimates for New Zealand volcanoes. The theme involves Research Institution GNS Science and several New Zealand universities. (https://resiliencechallenge.nz/scienceprogrammes/volcanism/).

New Zealand sits on an active plate boundary, with the Taupō Volcanic zone in the North Island as the southern-most extension of the Lau-Havre trough and backarc basin. Well-recorded eruptions in 1995/1996, 2006, 2007, 2012, 2016 and 2019 will serve as testing grounds for the new techniques. The project will develop and test several techniques that have been proposed to monitor volcanoes using seismic data. They will be tested on existing and soon-to-be-collected data that recorded eruptions on White Island/Whakaari, Ruapehu, and Tongariro volcanoes as well as other data sets. Techniques may include artificial intelligence methods to automatically determine earthquake locations and types, shear wave splitting measurements on earthquakes, and ambient noise analysis using cross-correlations on single and multiple stations to recover waveforms traveling between stations or scattered from structures near to the stations.

This project includes a generous scholarship funded by the Resilience to Nature's Challenges National Science Challenge (https://resiliencechallenge.nz/). The student will work with Professor Martha Savage of Victoria University of Wellington and Dr. Art Jolly of GNS Science.

The student will be expected to enrol as a PhD student at Victoria University of Wellington (VUW). GNS Science is a government-owned institution undertaking research in the Earth Sciences and related disciplines. VUW was ranked first in New Zealand in Earth Sciences. Information on the department is available here (http://www.victoria.ac.nz/sgees). Further information on the projects is available here https://www.wgtn.ac.nz/sgees/study/postgraduate-study/potential-projects-for-graduate-students.

Prospective candidates must have a strong background in geoscience and computing (some mathematics, physics, statistics and/or seismology experience is desirable), be proficient in one or more scientific programming languages (Matlab, Python, etc.), and have completed (or be expected to complete) a Master's or equivalent degree by the start of the PhD programme. Full details of Victoria University's eligibility criteria are available from the Faculty of Graduate Research website and http://www.vuw.ac.nz/fgr. A generous scholarship will be provided.

Applications including an up-to-date curriculum vitae, referee reports and evidence of previous study should be submitted to one of the addresses below. Evaluations will begin starting 1 September 2020. The start date is flexible but will be no later than 30 October, 2021.

Please note: *We are aware that there is some considerable uncertainty regarding current and future border restrictions due to COVID19 pandemic. Prospective candidates are encouraged to contact us to discuss any concerns or constraints on their ability to travel.*

Please direct all questions to:

Martha Savage, Martha.Savage@vuw.ac.nz, Art Jolly a.jolly@gns.cri.nz