



PhD position in physical volcanology at the University of Geneva (Switzerland)

Characterisation of volcanic deposits from large explosive eruptions (Aegean Arc) and modelling eruption dynamics

Juvenile pyroclasts of explosive silicic eruptions are the only available natural sample that preserves information on the state of magma at fragmentation. We propose to characterize the pyroclastic products from the largest explosive eruption of the South Aegean volcanic island arc (the KPT) and its precursor (Kefalos pyroclastic series) by a number of different methods (Hg-porosimetry, He-permeametry, X-ray computed microtomography). These units are exceptional mines of textural information due to abundance fresh, unconsolidated volcanic ash and pumice, and will permit a detailed comparison of pyroclasts from different eruptive styles. These results will be used as boundary conditions to simulate magma flow in volcanic conduits using an existing Finite Element code (Dufek and Bergantz, 2005).

Dufek, J. and Bergantz, G.W., 2005. Transient two-dimensional dynamics in the upper conduit of a rhyolitic eruption: a comparison of closure models for the granular stress. *Journal of Volcanology and Geothermal Research*, 143: 113-132.

Specific tasks include

- Generate porosity and permeability data on natural samples using laboratories at the University of Geneva
- Obtain 3D map of samples cores by X-ray microtomography (at the University of Lausanne), and treat this data numerically (using the shareware 3DMA-rock) to obtain statistical textural data.
- Run 2D flow simulations of magma in conduit to better understand magma fragmentation during large silicic volcanic eruptions
- Help teaching “practical courses” at the undergraduate level

We ask

- Masters degree in Physics, Geophysics or Geology (with a taste for Geophysics)
- Proven abilities in using computer codes
- Interest for natural processes

We offer

- A dynamic environment in one of the leading european centers for volcanology and a rich network of collaboration with institutions in France, USA, and Australia
- All the facilities necessary for the completion of this project (at the University of Geneva and University of Lausanne, situated 60 km away from Geneva)
- An appointment as Assistant Doctorant for an initial period of 3 years (provided that funds are confirmed)

FACULTÉ DES SCIENCES

SECTION DES SCIENCES DE LA TERRE

DEPARTEMENT DE MINÉRALOGIE

13, rue des Maraîchers | CH-1205 Genève

Tél. +41 22 379 66 24 | Fax +41 22 379 32 10



UNIVERSITÉ DE GENÈVE

Please send (1) your CV, (2) copy of University degree(s), (3) a short letter explaining your interest in the project and the reasons for undertaking a PhD study, and (4) names and complete addresses of two referees to Dr Olivier Bachmann (**before January 31, 2006**), either electronically or by mail at the address below:

Dr Olivier Bachmann
Section des Sciences de la Terre
University of Geneva
13, rue des Maraîchers
1205 Genève, Switzerland

[http://www.unige.ch/sciences/terre/mineral/volcano/en/members/faculty/
olivier.bachmann@terre.unige.ch](http://www.unige.ch/sciences/terre/mineral/volcano/en/members/faculty/olivier.bachmann@terre.unige.ch)