

Geneva, 20.09.2023

Postdoctoral researcher position at the University of Geneva

One fully financed (salary and research funds) **Postdoctoral researcher position** funded by the *Swiss National Science Foundation* is available at the Department of Earth Sciences of the University of Geneva (Switzerland). The contract will be for **24 months**. The Postdoctoral research will be part of a group including 4 PhD students and 3 postdoctoral researchers with expertise spanning from Petrology and volcanology, statistics and numerical modelling.

The doctoral candidates will be part of the group of **Volcanology and Petrology** (<https://www.unige.ch/sciences/terre/en/groups/petrology-and-volcanology/projects/>) of the Department of Earth Sciences of the University of Geneva and spend a minimum of 3 months at Deutsches Elektronen-Synchrotron (DESY).

Deadline

Application will be accepted until **October 31st 2023**.

The starting date is ideally January 2024 but can be discussed.

Project Title

Data Driven Imaging of Volcanic Plumbing Systems

Summary

VAMOS (VolcAnalogy, MOdelling, Statistics) uses information retrieved from mineral and glass chemistry as the target of numerical and statistical inversion modelling to link the thermal and chemical architecture of volcanic plumbing systems and the magnitude of well-studied past eruptions. On the base of these results, we will identify patterns in the eruptive record heralding eruptions of different magnitudes and use statistical emulation to estimate the volume of eruptible magma present today within the volcanic plumbing systems of the investigated volcanoes. To estimate eruption duration, we will invert chemical information on samples collected during past eruptions (e.g. 2021 Tajogaite eruption) using numerical and statistical modelling, to define the best proxies identifying the waning stage of eruptions. VAMOS will establish a workflow to estimate the magnitude and duration of future eruptions for any volcano on Earth.

The project was financed within the frame of the Swiss National Science Foundation *Sinergia* program and it is a collaborative and interdisciplinary project between the Department of Earth Sciences of the University of Geneva, The Geneva School of Economics and Management of the University of Geneva and the Istituto Nazionale di Geofisica e Vulcanologia (INGV-Pisa; Italy). Partners include the Deutsches Elektronen-Synchrotron DESY, INVOLCAN - Canary Islands, INGV Osservatorio Etneo, Universidad Nacional Autónoma de México, Department of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign (USA).

Methods

The successful candidate will work in close collaboration with Dr Michael Stuckelberger of DESY and collect microdiffraction data on a wide variety of experimentally synthesized minerals (initially clinopyroxene). These data will allow us to link crystallographic and chemical variations of minerals to

different conditions of synthesis. We aim to recalibrate existing thermobarometers and we will use extensively our expertise on machine learning. This experimental portion of the project will be combined with the collection and analyses of magmatic minerals from regions in which the conditions of magma emplacement are known from metamorphic phase relations.

The University of Geneva offers a wide range of state-of-the-art analytical facilities that will be fully available within the framework of VAMOS.

Requirements

The applicant should have a PhD on subjects close to mineralogy, petrology and/or volcanology. The postdoctoral researcher will be integrated in a dynamic research group and only highly motivated candidates will be considered for this position.

The interested applicants should send a **CV**, **academic record**, a **short motivation letter** (Maximum 1 A4 page), and **names and contacts of two potential referees** to:

Luca Caricchi: luca.caricchi@unige.ch

Michael Stuckelberger: michael.stueckelberger@desy.de

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