Supervisor: Juliet Biggs

PROJECT TITLE: Identifying Analogue Volcanoes from Satellite Monitoring Data.

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Project keywords: volcano, satellite, image processing

Project Background:
A common approach to forecasting volcanic behaviour is by identifying analogue systems, thus comparing and classifying monitoring signals is critical for volcano observatories. Previous databases have used archives of satellite data to define the spatial and temporal properties of volcano deformation patterns, but while the temporal span of a signal is often well-reported, the spatial characteristics are more challenging to extract.

![Fig 1: Spatial location of volcano deformation sources based on archived satellite imagery. From Ebmeier et al, 2018.](image1)

![Fig 2: Example satellite images. Features are current used to detect volcano deformation (e.g. Anantrasirichai et al, 2018), and this project will aim to develop this approach to classify deformation patterns.](image2)

Project Aims and Methods:
This project aims to use image ‘features’ to relate characteristics of the InSAR images to underlying magmatic properties. We will use image processing techniques to cluster together deformation patterns with similar characteristics. Ultimately, we are particularly interested in whether the clusters correspond to specific processes (e.g. eruptive, non-eruptive), magma composition/rheology or the underlying magmatic architecture. The same classification scheme will be applied to both real data and model simulations and used to provide a scientific foundation or the identification of analogue systems and volcano forecasting.
**Candidate requirements:**
This project would suit a geology, geophysics or computer sciences student with an interest in volcanic and magmatic systems. The student should be interested in developing their technical skills and will be trained in InSAR data processing, volcano geophysics and numerical modelling.

**Training:**
The student will be part of an ERC-funded team working on volcanic deformation (MAST), the Bristol Visual Information Laboratory and the UK’s Centre for the Observation and Modelling of Volcanoes, Earthquakes and Tectonics (COMET).

**Background reading and references:**

**Useful links**
http://www.bristol.ac.uk/earthsciences/courses/postgraduate/

**How to apply to the University of Bristol:**
http://www.bristol.ac.uk/study/postgraduate/apply/

**General Enquiries:**
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