

Candidate Information

Position: Research Fellow in Ice-Core Tephrochronology and Ash-Dispersion Modelling
School/Department: School of Natural and Built Environment
Reference: 26/113430
Closing Date: Monday 29 June 2026
Salary: £41,519 - £49,536 per annum.
Anticipated Interview Date: Friday 10 July 2026
Duration: 36 months

JOB PURPOSE:

To be a highly productive, ambitious and collaborative member of the NERC-funded SMASHING research project/team assisting in the delivery of the research activity specifically relating to tephrochronology, ash-dispersion modelling and evaluation of volcano-climate relationships.

The post is a critical role, and as such, successful applicants will have responsibilities in guided research, planning, day-to-day lab management, collaborations and dissemination of results.

Please note that the successful applicant must be available to start in this post by the beginning of September 2026.

MAJOR DUTIES:

1. Undertake research under the direction of the Lead Investigator, while exercising a high degree of independence in executing laboratory and modelling workflows.
2. Coordinate the selection and extraction of particle-rich, sub-annually-resolved ice core samples in collaboration with international partner laboratories (e.g., Desert Research Institute, Reno) using existing microparticle data sets.
3. Obtain reference samples of volcanic ash from sample repositories for comparative analysis.
4. Extract and mount tephra samples for analysis by light microscopy and major and trace element geochemical characterisation.
5. Perform particle morphological analysis using imaging software and light microscopy.
6. Conduct major element quantification via electron microprobe analysis and resolve complex provenances using Laser Ablation ICP-MS (LA-ICP-MS) trace element characterisation.
7. Develop, refine and implement tephra analytical and ash-dispersion modelling methodologies in accordance with project objectives.
8. Undertake training in ash-dispersion modelling, if required, and conduct ash-dispersion simulations.
9. Carry out analyses, critical evaluations, and interpretations of tephra physical and geochemical data using methodologies and other techniques appropriate to the project.
10. Contribute source-validated eruption parameters to the augmentation of global volcanic forcing databases (e.g., eVolv2k).
11. Liaise directly with the project climate-modelling team to integrate geochemical and ash-dispersion constraints into aerosol-climate models.
12. Produce high quality research outputs consistent with project aims and commensurate with career stage, including collaborating and co-authoring with the Lead Investigator and the wider project team on outputs.
13. In consultation with the project team, promote research milestones and outputs at national and international conferences.
14. Undertake supplementary duties relevant to the success of the project, including administrative duties and additional training and development activities as required.

ESSENTIAL CRITERIA:

1. Have or be about to obtain a PhD (or equivalent) in Palaeoecology, Earth Sciences, Physical Geography or cognate discipline.

2. Specific, relevant research experience to include:
 - A proven track record of working with low concentration cryptotephra, including use of light microscopy for shard quantification.
 - A proven track record of using major element geochemical characterisation of glass shards by electron microprobe analysis for tephra provenancing.
 - Experience with tephra morphological analysis using imaging software.
 - Experience of conducting trace element analysis of cryptotephra.
 - A demonstrable ability to use tephra geochemical data to carry out analyses, critical evaluations and interpretations of past volcanism, in a manner relevant to the research project.
3. Demonstrated ability to integrate multi-proxy datasets.
4. Strong publication record commensurate with stage of career.
5. Ability to contribute to broader management and administrative processes.
6. Ability to collate large datasets for submission to open access repositories.
7. Practical problem solving skills, independence of thought and initiative.
8. Ability to assess and organise resources.
9. Ability to communicate complex information in English effectively in oral and written format.
10. Ability to build relationships to develop internal and external networks.
11. Meticulous in laboratory practice, data handling, and reproducibility.
12. Ability to troubleshoot complex laboratory or modelling problems systematically.
13. Ability to work to tight deadlines.
14. Willingness and ability to undertake scheduled, project-funded research stays at partner institutions, specifically training in Ash3d with the USGS in Anchorage, Alaska, and S-isotope analysis at the University of St Andrews.

DESIRABLE CRITERIA:

1. Experience with, or capacity to learn, ash‑dispersion models (e.g. Ash3d).
2. Competence in Python/R for data analysis and modelling.
3. Familiarity with High-Performance Computing (HPC) environments.
4. Experience in statistical analysis of large multi-proxy datasets.
5. Experience with stable isotope geochemistry or ice‑core geochemistry.
6. Experience of working with ice-core samples.
7. Experience of preparing datasets for open repositories.
8. Experience of working as part of a collaborative team.
9. Experience of contributing to research impact activities/outreach.
10. Comfortable working at the interface of geochemistry, volcanology and climate modelling.