



Job description and selection criteria

Job title	Postdoctoral Research Assistant in Volcanic Fluid Geochemistry
Division	MPLS
Department	Earth Sciences
Location	South Parks Road, Oxford
Grade and salary	Grade 7 (£37,099 – £38,205 per annum)
Hours	Full time
Contract type	Fixed-term for 24 months.
Reporting to	Jon Blundy, Tamsin Mather and David Pyle
Vacancy reference	167209
Additional information	Start date on or before 31 January 2024. Interviews are planned for Monday 16 October 2023

Research topic	Oxford Martin Programme in Rethinking Natural Resources
Principal Investigator / supervisor	Professor Jon Blundy
Funding partner	The funds supporting this research project are provided by the Oxford Martin School

Job description

Overview of the role

The successful candidate will work closely with Professors Jon Blundy, Tamsin Mather and David Pyle to further our understanding of volcanic fluid geochemistry with a focus on rethinking natural resources. The role will have a specific focus on making measurements of volcanic and hydrothermal fluids and fluid inclusions from the Caribbean island of Montserrat and modelling their composition to build up a process understanding of metal distribution and partitioning within the volcano/hydrothermal system.

This post is part of the new Oxford Martin School programme in Rethinking Natural Resources, which aims to develop new ways to address the challenges that the Net Zero energy transition will place on demand for natural resources, both as a means of generating renewable energy and as sources of raw materials required for production, storage and transmission of electricity. The urgency of the transition calls for new thinking about where to explore for and how to recover natural resources, set against the backdrop of establishing social license and developing the right regulatory and financial framework. The Oxford Martin school programme will explore these issues with focused effort on one exemplar of innovation in the new resources landscape – the recovery of metals and geothermal energy from hot saline geofluids – in order to develop and test new frameworks for managing the needed transformations in geo-resource politics, science and economics. The programme will approach this problem through a carefully selected case-study – the British Overseas Territory of Montserrat – a location with geothermal energy potential and opportunities for co-recovery of raw materials, and where such activities could be socioeconomically transformative if managed well.

Working out the subsurface distribution and chemistry of hydrothermal fluids on Montserrat is a key objective of the programme. Fieldwork, in collaboration with the Montserrat Volcano Observatory, may include sampling of volcanic gases from the summit area or during grounding episodes, and ‘soufrières’ around the flanks (hot springs, fumaroles, boiling mud pools, steaming ground, warm ponds). Further measurements of geothermal fluids and scales from the three exploratory wells on the island, as well as fluid/melt inclusions from drillcore will be combined with geophysical data from other parts of the programme to build a model of the processes occurring in the subsurface. Volcanic aerosol and fluid samples will be analysed for major anions using ion chromatography and metals using ICP-MS. Fluid/melt inclusions will be analysed via laser-ablation ICP-MS. Well-bore scales will be characterized mineralogically by X-ray diffraction. These new data on the metals endowment and spatial distribution of fluids, we will allow us to better understand the raw materials potential of geothermal fluids on the island.

The post-holder will be based at the Department of Earth Sciences, University of Oxford, but will undertake field visits to Montserrat to collect samples and will be expected to liaise with other team members from the project across the other Oxford departments involved. The post is funded for up to 24 months and we wish to fill it at the earliest opportunity and at the latest before February 1st 2024.

Responsibilities/duties

- Undertake fieldwork and sampling of geothermal, hydrothermal and volcanic fluids on Montserrat. Lead their analysis for trace metal and major anions and cations by ion chromatography and ICP-MS. Adapt existing and develop new scientific techniques and analytical protocols.
- Liaise with the PIs on fluid inclusion and volcanic gas sampling and other rock analyses as required and with collaborators at the Montserrat Volcano Observatory to ensure that the aims of the Research Programme contribute to their activities as closely as possible.
- Lead modelling efforts using Geochemist’s Workbench (or similar package) to build an understanding of the processes controlling fluid composition and its variability within the broader system of the Soufriere Hills Volcano.
- Lead and collaborate in the preparation of scientific reports and journal articles and present papers and posters at external meetings/seminars.

- Manage own academic research and administrative activities, support some project management to co-ordinate multiple aspects of work to meet deadlines. Undertaking supporting coordination roles across the project as needed will also be expected.
- Act as a source of information and advice to other members of the Research Programme on scientific protocols and experimental techniques.
- Contribute ideas for new research projects, including those for Masters-level students, and develop ideas for generating research income.
- Test hypotheses and analyse scientific data from a variety of sources, reviewing and refining working hypotheses as appropriate
- Attend regular Research Programme workshops. Represent the Research Programme at external meetings/seminars, either with other members of the group or alone

The successful applicants will have an option to engage in teaching. This may include lectures and small-group teaching of undergraduates and graduate students. There is also scope for the PDRA to supervise Masters projects.

Selection criteria

Essential

- Hold, or be close to completion of, a relevant PhD/DPhil, together with relevant experience
- Must have experience have experience of collecting and analysing volcanic/geothermal fluid samples and/or fluid inclusions
- Must have fluid modelling skills using Geochemists Workbench (or similar package) to understand the thermodynamic principles determining the metal load of brine systems
- Should demonstrate an appreciation of the processes and thermodynamics governing the composition of geothermal/volcanic fluids
- Must show evidence of research ability including publications and presentations at international conferences
- Must have excellent written and oral communication skills
- Must have the ability to work in a multi-disciplinary team of researchers across the physical sciences, social sciences and humanities and to network and develop new contacts

****please note that 'close to completion' means that you must have submitted your PhD thesis at the time an offer is made.***

Desirable

- Experience of fluid inclusion preparation and analysis from drill core material
- Knowledge of ICP-MS, laser ablation ICP-MS and ion chromatography
- Experience of fieldwork in volcanic settings
- Knowledge of geothermal systems from academic or industrial perspective
- Experience of sampling volcanic metal emissions in plumes and from fumaroles
- Some experience of supervising PhD or Masters students
- Experience of project coordination and liaison with volcano observatories or similar organisations

About the University of Oxford

Welcome to the University of Oxford. We aim to lead the world in research and education for the benefit of society both in the UK and globally. Oxford's researchers engage with academic, commercial and cultural partners across the world to stimulate high-quality research and enable innovation through a broad range of social, policy and economic impacts.

We believe our strengths lie both in empowering individuals and teams to address fundamental questions of global significance, while providing all our staff with a welcoming and inclusive workplace that enables everyone to develop and do their best work. Recognising that diversity is our strength, vital for innovation and creativity, we aspire to build a truly diverse community which values and respects every individual's unique contribution.

While we have long traditions of scholarship, we are also forward-looking, creative and cutting-edge. Oxford is one of Europe's most entrepreneurial universities. Income from external research contracts in 2016/17 exceeded £564m and we rank first in the UK for university spin-outs, with more than 130 companies created to date. We are also recognised as leaders in support for social enterprise.

Join us and you will find a unique, democratic and international community, a great range of staff benefits and access to a vibrant array of cultural activities in the beautiful city of Oxford.

For more information please visit www.ox.ac.uk/about/organisation

Department of Earth Sciences

The Department of Earth Science conducts research across a broad range of disciplines. This work can loosely be divided into the following themes:

- Geophysics and geodynamics
- Planetary evolution and materials
- Oceanography, climate and palaeoenvironment
- Palaeobiology and evolution
- Geodesy, tectonics, volcanology and related hazards
- Earth resources

The department has a nation and international reputation for research excellence. It ranked highly in the UK for Earth and Environmental Sciences during the 2021 REF exercise (based both on overall grade, or on the fraction of research judged to be 4*).

The department presently consists of 28 academics (i.e Associate Professors and Professors) 47 research staff, and 32 support staff.

Thirty-five undergraduate students are admitted each year to read for a BA (3 years) or M. Earth Sci. (4 years) in Earth Sciences. The course provides a broad overview of the earth sciences and requires A levels (or equivalent) in maths and either physics or chemistry to enter. It attracts students of a very high calibre with A level grades of AAA* or higher. The final year of the M. Earth Sci. course includes a substantial research project during which students are embedded in department research groups.

Between 15 and 20 graduate students join the department every year to study for a D. Phil. They can be admitted directly to the department, or through the cross-University NERC Doctoral Training Programme in Environmental Research (<http://www.environmental-research.ox.ac.uk/>).

The department is housed in specialist new Earth Sciences building completed in late 2010. The building features a wing with 4 floors of dedicated services laboratories. These contain a wide range of analytical equipment enabling cutting-edge research in a broad range of earth science disciplines. Of these laboratories, 6 are designated as Small Research Facilities (SRFs):

- Cleansuite SRF
- Electron Microanalysis SRF
- Geofacilities SRF
- Multi-collector Mass Spectrometers SRF
- Stable Isotope SRF
- Trace Metal Analysis SRF
- Workshop SRF

Each of these SRFs are run by at least one full time permanent member of staff

For more information about the department please visit: www.earth.ox.ac.uk

The Department of Earth Sciences holds a Bronze Athena Swan award to recognise advancement of gender equality: representation, progression and success for all.

For further information about working at Oxford, please see:

www.ox.ac.uk/about_the_university/jobs/research/

<http://www.careers.ox.ac.uk>

MPLS Division

The Mathematical, Physical and Life Sciences (MPLS) Division is one of the four academic divisions of the University. Oxford is widely recognised as one of the world's leading science universities and the MPLS Division is home to our non-medical sciences, with 10 academic departments that span the full spectrum of the mathematical, computational, physical, engineering and life sciences, and undertake both fundamental research and cutting-edge applied work. Our research tackles major societal and technological challenges – whether developing new energy solutions or improved cancer treatments, understanding climate

change processes, or helping to preserve biodiversity, and is increasingly focused on key interdisciplinary issues. We collaborate closely with colleagues in Oxford across the medical sciences, social sciences and humanities, and with other universities, research organisations and industrial partners across the globe in pursuit of innovative research geared to address critical and fundamental scientific questions.

We have around 7,300 full and part-time students (including approximately 3,400 graduate students) and play a major role in training the next generation of leading scientists. Oxford's international reputation for excellence in teaching is reflected in its position at the top of the major league tables and subject assessments. MPLS academics educate students of high academic merit and potential from all over the world. Through a mixture of lectures, practical work and the distinctive college tutorial system, students develop their ability to solve diverse mathematical, scientific and engineering problems.

The disciplines within the MPLS Division regularly appear at the highest levels in rankings, including the Times Higher Education and QS world rankings. Nationally, the quality of the Division's research outputs and environment, and the resulting impact, was recognised through strong performances in the UK Research Excellence Framework in both 2014 and 2021.

For more information please visit: www.mpls.ox.ac.uk

How to apply

Before submitting an application, you may find it helpful to read the 'Tips on applying for a job at the University of Oxford' document, at www.ox.ac.uk/about/jobs/supportandtechnical/.

If you would like to apply, click on the **Apply Now** button on the 'Job Details' page and follow the on-screen instructions to register as a new user or log-in if you have applied previously. Please provide details of two referees and indicate whether we can contact them now.

You will also be asked to upload a CV and a supporting statement. The supporting statement must explain how you meet each of the selection criteria for the post using examples of your skills and experience. This may include experience gained in employment, education, or during career breaks (such as time out to care for dependants).

Your application will be judged solely on the basis of how you demonstrate that you meet the selection criteria stated in the job description.

Please upload all documents **as PDF files** with your name and the document type in the filename. **Please do not attach any manuscripts, papers, transcripts, mark sheets or certificates as these will not be considered as part of your application.**

All applications must be received by **midday** on the closing date stated in the online advertisement.

Please note that 'close to completion of' a PhD means that you need to have submitted your thesis at the time of an offer being made.

Information for priority candidates

A priority candidate is a University employee who is seeking redeployment because they have been advised that they are at risk of redundancy, or on grounds of ill-health/disability. Priority candidates are issued with a redeployment letter by their employing departments.

If you are a priority candidate, please ensure that you attach your redeployment letter to your application (or email it to the contact address on the advert if the application form used for the vacancy does not allow attachments)

Should you experience any difficulties using the online application system, please email recruitment.support@admin.ox.ac.uk. Further help and support is available from www.ox.ac.uk/about_the_university/jobs/support/. To return to the online application at any stage, please go to: www.recruit.ox.ac.uk.

Please note that you will be notified of the progress of your application by automatic emails from our e-recruitment system. **Please check your spam/junk mail** regularly to ensure that you receive all emails.

Important information for candidates

Pre-employment screening

Please note that the appointment of the successful candidate will be subject to standard pre-employment screening, as applicable to the post. This will include right-to-work, proof of identity and references. We advise all applicants to read the candidate notes on the University's pre-employment screening procedures, found at: www.ox.ac.uk/about/jobs/preemploymentscreening/.

Data Privacy

Please note that any personal data submitted to the University as part of the job application process will be processed in accordance with the GDPR and related UK data protection legislation. For further information, please see the University's Privacy Notice for Job Applicants at: www.admin.ox.ac.uk/councilsec/compliance/gdpr/privacynotices/job/. The University's Policy on Data Protection is available at: www.admin.ox.ac.uk/councilsec/compliance/gdpr/universitypolicyondataprotection/.

The University's policy on retirement

There is no normal or fixed age at which staff in posts at **Grades 1-10** have to retire. Staff at these grades may elect to retire in accordance with the rules of the applicable pension scheme, as may be amended from time to time. The University may not request staff at these grades to take retirement at a particular age, nor suggest that they consider doing so. It is for individual members of staff to decide when they wish to retire.

Equality of Opportunity

Entry into employment with the University and progression within employment will be determined only by personal merit and the application of criteria which are related to the duties of each particular post and the relevant salary structure. In all cases, ability to perform the job will be the primary consideration. No applicant or member of staff shall be discriminated against because of age, disability, gender reassignment, marriage or civil partnership, pregnancy or maternity, race, religion or belief, sex, or sexual orientation.

Benefits of working at the University

University Club and sports facilities

Membership of the University Club is free for all University staff. The University Club provides social, sporting and hospitality facilities. Staff can also use the University Sports Centre on Iffley Road at discounted rates, including a fitness centre, powerlifting room, and swimming pool. See www.club.ox.ac.uk and www.sport.ox.ac.uk/oxford-university-sports-facilities.

Information for international staff

The University offers support and advice to international staff, including a visa loan scheme to cover the costs of UK visa applications for staff and their dependents.

See www.admin.ox.ac.uk/personnel/permits/reimburse&loanscheme/.

Information for staff new to Oxford

If you are relocating to Oxfordshire from overseas or elsewhere in the UK, the University's Welcome Service website includes practical information about settling in the area, including advice on relocation, accommodation and local schools. See www.welcome.ox.ac.uk.

The University of Oxford Newcomers' Club

The University of Oxford Newcomers' Club is an organisation run by volunteers that aims to assist the partners of new staff to settle into Oxford and to provide them with an opportunity to meet people in the area. See www.newcomers.ox.ac.uk.

Childcare

The University has excellent childcare services with five University nurseries, as well as University-supported places at many other private nurseries.

For full details including how to apply and the costs, see www.admin.ox.ac.uk/childcare.

Family-friendly benefits

The University subscribes to My Family Care service through which staff are eligible to register for emergency back-up childcare and adultcare services, a 'speak to an expert' advice service and a wide range of guides and webinars through a website called the Work+Family space.

See: www.admin.ox.ac.uk/personnel/staffinfo/benefits/family/mfc/.

Disabled staff

We are committed to supporting members of staff with disabilities or long-term health conditions. For further details, including information about how to make contact, in confidence, with the University's Staff Disability Advisor, see www.admin.ox.ac.uk/eop/disab/staff.

Staff networks

The University has a number of staff networks including the Oxford Research Staff Society, BME staff network, LGBT+ staff network and a disabled staff network. You can find more information at www.admin.ox.ac.uk/eop/inpractice/networks/.

Additional benefits

Staff can enjoy a range of other benefits and discounts, including free entry to the Botanic Gardens and University colleges, and discounts at University museums.

See www.admin.ox.ac.uk/personnel/staffinfo/benefits.