



## Job description and selection criteria

<b>Job title</b>	<b>Postdoctoral Research Assistant in Experimental Geobiology</b>
<b>Division</b>	<b>MPLS</b>
<b>Department</b>	<b>Earth Sciences</b>
<b>Location</b>	<b>South Parks Road, Oxford</b>
<b>Grade and salary</b>	<b>Grade 7 (£36,333 - £37,386 pa)</b>
<b>Hours</b>	<b>Full time</b>
<b>Contract type</b>	<b>Fixed-term for 3 years</b>
<b>Reporting to</b>	<b>Dr Ross Anderson</b>
<b>Vacancy reference</b>	<b>165525</b>

<b>Research topic</b>	Experimentally testing the role and mechanisms of clay-organic interactions in the fossilisation of early life soft tissues
<b>Principal Investigator / supervisor</b>	Dr Ross Anderson
<b>Project team</b>	Team working on Royal Society funded project, <i>Preserving the Rise of Complex Life</i> , including collaborator Prof Nicholas Tosca (University of Cambridge)
<b>Project web site</b>	<a href="https://palaeobiology.web.ox.ac.uk/people/dr-ross-anderson">https://palaeobiology.web.ox.ac.uk/people/dr-ross-anderson</a>
<b>Funding partner</b>	Royal Society
<b>Recent publications</b>	<ul style="list-style-type: none"> <li>• Anderson, R.P., et al. 2021. Early formation and taphonomic significance of kaolinite associated with Burgess Shale fossils. <i>Geology</i> 49, 355–359.</li> <li>• Anderson, R.P., et al. 2020. Aluminosilicate haloes preserve complex life approximately 800 million years ago. <i>Interface Focus</i> 10, 20200011.</li> <li>• Anderson, R.P., et al. 2018. A mineralogical signature for Burgess Shale-type fossilization. <i>Geology</i> 46, 347–350.</li> <li>• McMahon, S., Anderson, R.P., et al. 2016. Experimental evidence that clay inhibits bacterial decomposers: Implications for preservation of organic fossils. <i>Geology</i> 44, 867–870.</li> </ul>

## Job Description

### Overview of the role

The emergence of complex eukaryotic life as a dominant force in ecosystems during the Neoproterozoic Era (1,000–539 million years ago) is perhaps the most important geobiological revolution in our planet's history. Despite its importance, we still know little of the tempo of this event or whether and how it was linked to major environmental changes such as rising marine oxygen, changing nutrient budgets, and climatic perturbations.

The principal challenge has been the rarity of fossils. We need to better understand where to look for key early fossils and whether their occurrences are biased to specific environments.

The first microscopic eukaryotes lacked hard shells and skeletons, which commonly preserve as fossils. Instead, they required poorly understood environmental conditions for their preservation. Recent investigations of the chemistry of early fossils and their surrounding sedimentary matrix have suggested molecular interactions between clay minerals (e.g., kaolinite) and organic matter may play a critical role (e.g., Anderson et al., 2020 *Interface Focus*; Anderson et al. 2021 *Geology*). However, clay minerals may interact with organic material through a variety of mechanisms, including, for example, the physical binding of pre-existing particles to organic material or crystallisation from solution on the surfaces of organic matter.

The PDRA will lead the design and execution of geochemical experiments that will examine clay-organic interactions in the laboratory and address this knowledge gap.

A major goal for this research is to identify the principal controls on the physical and/or chemical interactions between clay minerals and organic matter, and use this knowledge to unravel the conditions most conducive to the fossilisation of early life. The PDRA will lead the design of simple experiments first investigating the conditions that promote nucleation and growth of clay minerals from multicomponent solutions (i.e., seawater), and the role of organic functional groups and solid-phase organic substrates in directing this process.

The PDRA will initially utilise experimental infrastructure available in the Aqueous Geochemistry Laboratory at the University of Cambridge, in collaboration with Nicholas Tosca, which includes anoxic chambers, auto-titration, electrochemistry and in-situ monitoring techniques including Raman spectroscopy. Experiments will be characterised by a range of analytical techniques including, e.g., ATR-FTIR, GC-MS, HR-TEM, ICP-OES, Raman, SEM-EDS, and XRD. There will be considerable opportunities for the PDRA to undertake laboratory visits to Cambridge at the outset, with the goal of initiating some experimental techniques in the Department of Earth Sciences at Oxford.

This work is part of a project funded by the Royal Society and led by Ross Anderson. The project is taking multiple approaches (e.g., palaeontology, analytical geochemistry, experimental geochemistry) to understand the preservation of early life on our planet. The PDRA will have the opportunity to interact with other project members in Oxford as well as partners internationally including at UC Santa Barbara and Stanford University. Funding will also be available for the PDRA to present their research at international meetings.

Lastly, the PDRA will be part of the [Oxford Palaeobiology Group](#), a large group of researchers (>30), including multiple faculty, independent research fellows, PDRAs, and postgraduate students from the Department of Earth Sciences and the University Museum of Natural History (OUMNH). Weekly PalaeoClub seminars in term-time provide a forum for collaborative discussion as well as informal feedback on ongoing research. The [OUMNH](#) provides access to world-class palaeontological research collections.

## Hazard-specific / Safety-critical duties see:

[www.admin.ox.ac.uk/personnel/recruit/preempcheck/compulsorychecks/medical](http://www.admin.ox.ac.uk/personnel/recruit/preempcheck/compulsorychecks/medical)

This job includes the following hazards or safety-critical activities which will require successful pre-employment health screening through our Occupational Health Service before the successful candidate will be allowed to start work:

- Lone Working
- Work in hot or cold environments
- Driving on University business
- Regular manual handling
- Working with Ionising Radiation
- Working with category 3b or 4 lasers (laser safety class)
- Work with allergens, e.g., laboratory animals, pollen, dust, fish or insects etc.
- Work with any substance which has any of the following pictograms on their MSDS:



- Travel outside of Europe or North America on University Business

## Responsibilities/duties

- Lead the development of new scientific techniques and experimental protocols to understand detrital clay attachment to and the precipitation of authigenic clays on organic substrates, testing the roles and mechanisms of clay-organic interactions in the fossilisation of soft tissues
- Explore the environmental (e.g., pH, water chemistry) and biological factors (e.g., organic tissue type) that foster organic interactions with clays of different type
- Use analytical tools including ATR-FTIR, GC-MS, HR-TEM, ICP-OES, Raman, SEM-EDS, and XRD to assess experimental products
- Collaborate with Nicholas Tosca (University of Cambridge) to develop experimental protocols, reviewing and refining working hypotheses
- Interact with colleagues at Oxford, Cambridge, Santa Barbara, and Stanford to constrain experimental protocols based on geological/palaeobiological data
- Collaborate in the preparation of scientific reports and journal articles and occasionally present papers and posters
- Manage own academic research and administrative activities, involving small scale project management, to co-ordinate multiple aspects of work to meet deadlines
- Contribute ideas for new research projects, develop ideas for generating research income, and present detailed research proposals to senior researchers
- Act as a source of information and advice to other members of the group on scientific protocols and experimental techniques
- Represent the research group at external meetings/seminars, either with other members of the group or alone

## Selection criteria

### Essential

- Hold, or be close to completion of, a PhD/DPhil\*, together with experience, in a relevant discipline, including Earth Sciences, Geology, Geochemistry, and/or Chemistry
- Experience in techniques in experimental aqueous geochemistry and analytical geochemistry
- Experience in theoretical aqueous geochemistry, which may include reaction path modelling (i.e., Geochemist's Workbench, PHREEQc, EQ3/6, or others)
- Ability to manage own academic research and associated activities
- Previous experience of contributing to publications/presentations
- Ability to contribute ideas for new research projects and research income generation
- Excellent communication skills, including the ability to write for publication, present research proposals and results, and represent the research group at meetings

***\*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 taphonomic experiments in controlled conditions
- Knowledge of exceptional fossil preservation
- Knowledge of the Neoproterozoic Earth System
- A proven ability to work in a team
- Experience of actively collaborating in the development of research articles for publication

## 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](http://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 national 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.EarthSci. (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.EarthSci. 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 a 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](http://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.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](http://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/](http://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](mailto:recruitment.support@admin.ox.ac.uk). Further help and support is available from [www.ox.ac.uk/about\\_the\\_university/jobs/support/](http://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](http://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/](http://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/](http://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/](http://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](http://www.club.ox.ac.uk) and [www.sport.ox.ac.uk/oxford-university-sports-facilities](http://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/](http://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](http://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](http://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](http://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/](http://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](http://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/](http://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](http://www.admin.ox.ac.uk/personnel/staffinfo/benefits).