Salary: Grade 7 (£33,797 – £40,322 p.a.)
Reference: ENVEE1394

Fixed term until 31 July 2020 (to start no later than 1 April 2020)
We will consider job share / flexible working arrangements
Research Fellow in Sustainable Geoenergy Solutions: Physiochemical processes of subsurface storage, School of Earth and Environment, Faculty of Environment

Are you an ambitious researcher with a broad background in geology or geophysics? Do you want to be part of a cutting edge geoscience research programme? Do you want to make a difference by delivering research to underpin robust, sustainable and just climate and energy solutions? Do you want to develop your skills in trans-disciplinary research, equipping yourself with the expertise needed for linking geoscience knowledge and sustainable, just development?

The University of Leeds has world-leading expertise in subsurface characterization, resource exploration, geoengineering and tectonics through its long-established oil and gas, fundamental tectonic, metamorphic and geophysical research and teaching programmes. In response to the University’s bold climate crisis policy announcement, we aim to harness this expertise to focus on the challenges relating directly to decarbonising the energy supply: energy/heat storage, and subsurface disposal and storage. We have a wealth of knowledge, expertise and skills to be applied to these areas as we work together with the Sustainability Research Institute and the Priestley International Centre for Climate, towards a net-zero greenhouse gas emissions future for our campus, regionally, nationally and globally.

These innovative transdisciplinary projects are aimed to address a significant gap in understanding of potential geoenergy opportunities, social acceptance, barriers and technologies for a just energy transition in line with Net Zero Carbon ambitions. These projects will set a novel standard of how to approach sustainable geoenergy solutions, developing a set of briefing notes and academic outputs to inform decision makers at multiple scales of governance. Our approach will evaluate the challenges and opportunities of a geoenergy problem from the geoscience and social/governance perspectives – a necessity if we are to deliver sustainable, just and responsible solutions for the energy transition. Each pair of projects will be co-supervised by an academic lead from the geosciences and an environmental social scientist.

You will have completed a PhD or be close to completion (i.e. the initial thesis needs to have been handed in at the point of application) in geoscience or a closely allied discipline. You will be eager to work in a team of geoscientists and social scientists to
enhance the portfolio of the University of Leeds in contributing to Sustainable Geoscience based solutions in the Energy Transition. You will have the ability to conduct independent research and have excellent communication, planning and team working skills.

Storage of nuclear waste, heat energy, hydrogen and carbon dioxide in the subsurface and heat generation from deep geothermal sources are essential for a safe and sustainable decarbonisation. However, there remains a gap in our ability to assess the dynamic links between the physical and chemical processes associated with such storage/heat extraction. Reactive transport models are mainly focussed on the chemical reactions associated with fluid influx and / or outflow, however there are simultaneous changes in the physical and mechanical properties of a storage site associated with such reactions.

In this project, you will focus on the strategies to improve our scientific understanding of (a) how fluids flow and react within a subsurface site as they pertain to decarbonisation technologies such as underground thermal energy, carbon dioxide or hydrogen storage, and (b) how this flow changes the mechanical properties of the storage site and with that its structural integrity in the short and long term. This project is focused on identifying the necessary avenues of research in this challenging area.

What does the role entail?

As a Postdoctoral Research Fellow your main duties will include:

- Providing literature review of the current state of the art of reactive transport modelling in porous media;
- Providing literature review of mechanical-chemical feedback mechanisms associated with subsurface storage;
- Providing literature review of the assessment of long term chemical and physical stability of different subsurface storage mediums for decarbonisation technologies;
- Collating and analysing data to identify the main sources of uncertainty and potential hazard in subsurface storage;
- Engagement with colleagues within the School of Earth and Environment and the wider University of Leeds Research community to identify the research potential in the subject area, focussing on numerical, analytical and experimental capabilities in the subject area;
• Engagement with the Institute of Fluid Dynamics to identify research capabilities in the subject area;
• Working with the partner social scientist and colleagues at the Priestly Centre for Climate Change to inform about the social and regulatory demands on subsurface storage – onshore and offshore;
• Working both independently and as part of a larger team of researchers and stakeholder, engaging in knowledge-transfer activities where appropriate and feasible;
• Preparation, organization and participation of workshop at University of Leeds on “Dynamics of the physical and chemical processes associated with subsurface storage: Research Challenges and Solutions” - planned for late June 2020;
• Providing a concise brief on research results including a 5 page research proposal draft;
• Contributing to the research culture of the School, where appropriate;
• Generating and pursuing independent and original research ideas in the appropriate subject area;
• Contributing to setting the direction of the research project and team including preparing proposals for funding in collaboration with colleagues;
• Evaluating methods and techniques used and results obtained by other researchers and to relate such evaluations appropriately to your own work;
• Disseminating research results through recognised forms of output.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

What will you bring to the role?

As a Postdoctoral Research Fellow you will have:
• A PhD or near completion - i.e. the initial thesis needs to have been handed in at the point of application in Geosciences or a closely allied discipline;
• A strong background in geology, geophysics or geochemistry;
• Experience of handling large datasets and 3D geophysical modelling software;
• Good time management and planning skills, with the ability to meet tight deadlines, manage competing demands and work effectively under pressure without close support;
- A proven track record of peer-reviewed publications;
- Excellent written and verbal communication skills including presentation skills;
- A proven ability to work well both individually and in a team;
- A strong commitment to your own continuous professional development.

You may also have:
- Experience of geochemical, fluid flow, physical flow experiments or their numerical modelling;
- Experience in working on processes relevant to in the energy sector;
- Experience in material characterization;
- Experience in working in the energy sector

**How to apply**

You can apply for this role online; more guidance can be found on our [How to Apply](#) information page. Applications should be submitted by 23.59 (UK time) on the advertised closing date.

**Contact information**

To explore the post further or for any queries you may have, please contact:

**Dr Rachael Spraggs**, Director Institute of Applied Geoscience  
Tel: +44 (0)113 343 3057  
Email: r.e.spraggs@leeds.ac.uk

**Professor Sandra Piazolo**, Professor in Structural Geology and Tectonics  
Tel: +44 (0)113 343 0010  
Email: s.piazolo@leeds.ac.uk

**Additional information**

Find out more about the [Faculty of Environment](#)

Find out more about our [School of Earth and Environment](#), Institutes of [Applied Geoscience](#), [Geophysics and Tectonics](#) and [Earth Surface Science](#)
Find out more about our Research and associated facilities

Find out more about Equality in the Faculty

A diverse workforce
The Faculty of Environment has received a prestigious Athena SWAN silver award from Advance HE, the national body that promotes equality in the higher education sector. This award represents the combined efforts of all schools in the Faculty and shows the positive actions we have taken to ensure that our policies, processes and ethos all promote an equal and inclusive environment for work and study.

Working at Leeds
Find out more about the benefits of working at the University and what it is like to live and work in the Leeds area on our Working at Leeds information page.

Candidates with disabilities
Information for candidates with disabilities, impairments or health conditions, including requesting alternative formats, can be found on our Accessibility information page or by getting in touch with us at disclosure@leeds.ac.uk.

Criminal record information

Rehabilitation of Offenders Act 1974
A criminal record check is not required for this position. However, all applicants will be required to declare if they have any ‘unspent’ criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our Criminal Records information page.