CANDIDATE BRIEF

Research Fellow in Geosolutions: Subsurface Imaging and Uncertainty for Georesources, Faculty of Environment

Salary: Grade 7 (£38,205 – £45,585 p.a. depending on experience)

Reporting to: Andrew Nowacki

Reference: ENVEE1761

Fixed term for 36 months to complete specific time limited work

Location: University of Leeds (with scope for hybrid working)

We are open to discussing flexible working arrangements

Overview of the Role

Are you an ambitious researcher looking for your next challenge? Do you have an established background in geophysics and want to apply your skills to solve challenges using sustainable georesources? Do you want to further your career in one of the UK's leading research intensive universities?

We are seeking a Research Fellow to fulfil a key role in our project to better understand how to build geophysical models of the subsurface which account for the uncertainty in current geophysical data, in order to assess the potential for sustainable energy production and resource use. You will be a key part of the Geosolutions Centre within the School of Earth and Environment at the University of Leeds and work closely with Dr Andy Nowacki. You will be part of a large interdisciplinary team of other PDRAs, PhDs and academic staff, and will collaborate closely with others in the University and elsewhere. You will work to address the challenges of climate change through understanding and using the solid Earth, including as part of the University's Climate Plan.

You will research, use and build on existing methods to take data about the subsurface (seismic surveys, borehole data, geological mapping and other data) and produce estimates of the physical properties of the subsurface, and crucially, the associated uncertainty on those estimates. Initially, you will focus on geothermal resources in Utah (the FORGE site) and Ethiopia (Aluto and Corbetti) using existing seismic data. Next you will incorporate magnetotelluric and other data and appraising different and new approaches to properly testing hypotheses of subsurface processes. You will be responsible for leading the development of the approach, which could include transferring learning from other geographic regions and data types, machine learning methods, Bayesian inference and interrogation theory. The post may involve travel to Utah and Italy in support of your work and attendance at international conferences, such as the World Geothermal Congress.

You will have a PhD, or be near to completing a PhD, in geophysics, geostatistics, physics, applied mathematics or a similar discipline with a strong background in data analysis or imaging as applied to the Earth. You will also have the ability to conduct independent research and evidence of peer-reviewed publications in international journals. In addition, you will have excellent communication, planning, and team working skills.

Main duties and responsibilities

- Designing, planning and undertaking a programme of research in collaboration with Dr Andrew Nowacki and others as part of the Geosolutions Centre;
- Collating, assessing and developing methods to image and understand the subsurface based on existing geophysical, geological, borehole, temperature and other data, and the uncertainties in this estimate;
- Applying these methods to data from the a range of geothermal power settings, including USA and Ethiopia and testing hypotheses relating fracturing to fluid flow and power generation;
- Incorporating additional data into imaging procedures to target specific research questions;
- If appropriate, directing or conducting future geophysical surveys to test imaging methods and the inferences which can be drawn from them;
- Generating and pursuing independent and original research ideas in the appropriate subject area;
- Developing research objectives and proposals and 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;
- Preparing papers for publication in leading international journals and disseminating research results through other recognised forms of output;
- Working both independently and also as part of a larger team of researchers, engaging in knowledge-transfer activities where appropriate and feasible;
- Maintaining your own continuing professional development and acting as a mentor to less experienced colleagues as appropriate;
- Contributing to the training of both undergraduate and postgraduate students, including assisting with the supervision of projects in areas relevant to the project.

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.

Qualifications and skills

<u>Essential</u>

- A PhD or near completion (i.e. the initial thesis needs to have been handed in at the point of application) in geophysics, physics, applied mathematics, or a similar discipline;
- A strong background in the analysis of subsurface data or development of geophysical imaging methods;
- Demonstrated ability to adapt or develop novel methods to interpret subsurface data;
- Demonstrated ability to link synthetic data from simulations to real-world observations;
- Evidence of peer-reviewed publications in international journals;
- Good time management and planning skills, with the ability to meet tight deadlines, manage competing demands and work effectively under pressure without close support;
- 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.

<u>Desirable</u>

- Demonstrated experience of comparing outputs from computer simulations to Earth observations;
- Experience of the development of reproducible scientific software to analyse and/or simulate geophysical data, using programming languages such as Julia, Fortran or Python;
- Experience using supervised or unsupervised learning to automate data analyses;
- Proven ability to deal with large datasets (comprising tens of thousands of recordings or more);
- Demonstrated experience working in collaboration with scientists across multiple institutions;
- A track record of supporting your peers and collaborators in their own research.

Additional information

Please note: If you are not a British or Irish citizen, from 1 January 2021 you will require permission to work in the UK. This will normally be in the form of a visa but, if you are an EEA/Swiss citizen and resident in the UK before 31 December 2020, this may be your passport or status under the EU Settlement Scheme.

Please note that this post may be suitable for sponsorship under the Skilled Worker visa route but first-time applicants might need to qualify for salary concessions. For more information please visit: www.gov.uk/skilled-worker-visa

For research and academic posts, we will consider eligibility under the Global Talent visa. For more information please visit: https://www.gov.uk/global-talent

Find out more about our School of Earth and Environment

Find out more about the Faculty of Environment

Find out more about our Research and associated facilities

Find out more about equality in the Faculty.

Our University
As an international research-intensive university, we welcome students and staff from all walks of life and from across the world. We foster an inclusive environment where all can flourish and prosper, and we are proud of our strong commitment to student education. Within the Faculty of Environment we are dedicated to diversifying our community and we welcome the unique contributions that individuals can bring, and particularly encourage applications from, but not limited to Black, Asian, people who belong to a minority ethnic community; people who identify as LGBT+; and disabled people. Candidates will always be selected based on merit and ability.

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

We are a campus based community and regular interaction with campus is an expectation of all roles in line with academic and service needs and the requirements of the role. We are also open to discussing flexible working arrangements. To find out more about the benefits of working at the University and what it is like to live and work in the Leeds area visit 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 hr@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.