UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Dynamics and Evolution of Planetary Cores, School of Earth and Environment

Salary: Grade 7 (£33,797 – £40,322 p.a.) Due to funding restrictions it is unlikely that we will be able to offer above £33,797 p.a.

Reference: ENVEE1370

Closing date: 2 January 2020

Fixed term until 30 November 2021 due to external funding

We will consider job share/flexible working arrangements

Research Fellow in Dynamics and Evolution of Planetary Cores
School of Earth and Environment, Faculty of Environment

Are you an ambitious researcher looking for your next challenge? Do you have a background in geomagnetism, deep Earth geophysics or fluid dynamics? 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 by developing computational fluid dynamical models of liquid-solid interactions in planetary cores. The project combines cutting edge experimental data with novel mathematical models to explore the role of two-phase flows in generating planetary magnetic fields. You will work closely with Dr Chris Davies, and be based in the deep-Earth research group within the School of Earth and Environment at the University of Leeds. This work is part of a multidisciplinary NSF-NERC-funded collaboration between the University of Leeds and the University of California San Diego linking experimental and dynamical models of planetary cores.

You will produce a computer model that describes the dynamics and evolution of two-phase (solid and liquid) regions in planetary cores, building on and generalising recent work undertaken by the group (Davies and Pommier, 2018; Wong, Davies, Jones, 2018). You will apply the model to a variety of settings where solid phases are produced near the top of planetary cores, e.g. the `snow' of solid iron in small terrestrial cores or the precipitation of oxides in Earth's core. Working with colleagues at UC San Diego, you will incorporate their new determinations of partitioning behaviour and transport properties of core materials into the model. The aim is to predict the properties of two-phase regions in planetary cores, e.g. their thickness and density stratification, and their role in generating magnetic fields over geological timescales.

You will have a PhD (or be close to completion) in geophysics or a similar highly numerical discipline with a strong background in computational and/or mathematical modelling. You will also have the ability to conduct independent research and a developing track record of publications in international journals. In addition, you will have excellent communication, planning, and team working skills.



What does the role entail?

As Research Fellow, your main duties will include:

- Designing, planning and undertaking a program of research in collaboration with Dr Chris Davies and co-investigators at the University of California San Diego as part of the National Science Foundation - Natural Environment Research Council (NSF-NERC) funded project “Integrated experimental and dynamical modelling of top-down crystallisation in terrestrial cores”;
- Developing a computer model that describes the dynamics and evolution of two-phase regions in planetary cores, building on the work of Davies and Pommier (2018) and Wong, Davies, Jones (2018);
- Generating and pursuing original research ideas in the appropriate subject area;
- Communicating or presenting research results through publication, workshops and conference presentations;
- 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, where appropriate, 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.

What will you bring to the role?

As a Research Fellow you will have:

- A PhD (or be close to completion) in geophysics or a similar highly numerical discipline;
- A strong background in mathematical and/or computational modelling;



- Knowledge and expertise in one or more of the following subjects as applied to understanding processes in planetary interiors: convection, planetary magnetism, two-phase flows;
- Experience of conducting research;
- A track record of successful, high quality, research outputs;
- Good time management and planning skills, with the ability to meet deadlines and work effectively under pressure.
- Excellent written and verbal communication skills;
- Proven ability to manage competing demands effectively, responsibly and without close support;
- 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 with either Fortran or Python programming languages.

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 Chris Davies, Associate Professor in Theoretical Geophysics and NERC Independent Research Fellow
Tel: +44 (0)113 343 1140
Email: c.davies@leeds.ac.uk

Additional information

Find out more about the Faculty of Environment.

Find out more about our School.

Find out more about our Research and associated facilities.



Find out more about Athena Swan 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
You can find out more about our generous benefits package and more about what it is like to work at the University and live 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.