



UNIVERSITY OF LEEDS

CANDIDATE BRIEF

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



Salary: Grade 7 (£33,199– £39,609 p.a.)

Due to funding restrictions, it is unlikely that we will be able to appoint above £33,199 p.a.

Reference: ENVEE1334

Closing date: 2 July 2019

Fixed term until 31 August 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 an established 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 models of crystallization 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](#). 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.

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;
- 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, 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 near completion - i.e. the initial thesis needs to have been handed in at the point of application in geophysics or a similar highly numerical discipline;
- A strong background in mathematical and/or computational modelling;
- Knowledge of one or more of the following subjects: fluid dynamics, convection, planetary magnetism or geodynamics;
- Demonstrable experience of conducting research;
- Evidence of a strong commitment to publishing scientific results at an international level;



- 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;
- 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:

- A track record of successful, high quality, publications.

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](#)

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](#).

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.

