UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Aerosol Modelling, Faculty of Environment

Salary: Grade 7 (£34,304 – £40,927 p.a.)

Reference: ENVEE1585

Fixed-term for 30 months – due to external funding

We will consider job share / flexible working arrangements

Research Fellow in Aerosol Modelling
School of Earth and Environment, Faculty of Environment

Would you like to help to address one of the biggest uncertainties in climate projections? Do you have an established background in clouds and aerosol research and do you want to further your career in one of the world's leading atmospheric science institutes?

You will become a key team member of the M-Phase project "Resolving climate sensitivity associated with shallow mixed phase cloud in the oceanic mid- to high-latitudes". Shallow mixed-phase clouds are a critical but poorly understood part of the climate system. M-Phase aims to address this deficit through a combination of lab, field and modelling work. It is a major £3 Million project funded by NERC with multiple partners including the University of Manchester and the UK Met Office. M-Phase is part of the broader NERC Uncertainty in Climate Sensitivity due to Clouds programme.

In this position you will work closely with experimentalists to define new sources of atmospheric ice-nucleating particles (INP), which you will then represent in the UK's regional and global climate models. There is emerging evidence that there are important ice-nucleating particle sources across the mid- and high-latitude terrestrial environment that are not currently represented in models. You will then work closely with the cloud modelling team who will use the improved models of INP to simulate the formation of ice and its effects on climate. In M-Phase we have now run an aircraft campaign flying north of Scandinavia, a ship campaign in the Labrador Sea and are planning another aircraft study of aerosol and cloud over the Labrador Sea this coming autumn. Hence, you will be in an excellent position to exploit several unique datasets alongside M-Phase staff and aligned PhD students. Finally, you will consider how INP may change in the future in response to changes in climate.

Our existing model includes a description of low latitude desert dust (Vergara-Temprado et al., 2017), but we know that we are missing mid-high latitude sources (e.g. Sanchez-Marroquin et al., 2020). We also know that the INP concentration is of first order importance for cloud albedo (Vergara-Temprado et al., 2018), with high INP leading to low amounts of supercooled water and lower albedo. In a warmer future world, these clouds will contain less ice and will therefore be more reflective, which represents a strong negative climate feedback (Storelvmo et al. 2015; Murray et al., 2021). It has been shown that improving the representation of ice in clouds increases

the equilibrium climate sensitivity (the amount the planet will warm with a doubling of CO_2) by 2 K (Tan et al., 2016). Hence, the present day INP concentration directly impacts the extent to which our planet will warm and the work you will do within M-Phase will therefore be critically important.

What does the role entail?

As a Research Fellow, your main duties will include:

- Developing expertise in the use and development of the UK climate and Earth system models in global and regional configurations;
- Leading the work on the representation of new ice-nucleating particle (INP) sources in the models;
- Evaluating the global model against measurements from M-Phase and earlier projects, and define appropriate model development activities to improve model-measurement agreement;
- Performing source apportionment modelling to resolve INP sources, in collaboration with the experimental field and laboratory researchers in M-Phase;
- Generating and pursue independent and original research ideas in the appropriate subject area;
- Evaluating and interpret methods and results obtained by other researchers in M-Phase and relate such evaluations appropriately to your own work;
- Preparing papers for publication in leading international journals;
- Presenting the results of your work at project workshops and international conferences;
- Working both independently and also as part of a larger team of researchers, engage in knowledge-transfer activities where appropriate and feasible;
- Maintaining your own continuing professional development and act as a mentor to less-experienced colleagues as appropriate;
- Contributing to the training of 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.



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 atmospheric science or a closely allied discipline;
- A strong background in atmospheric aerosol processes;
- Experience in using computer coding languages (e.g. Python);
- Experience of handling large datasets from models;
- 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 in reputable journals;
- 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 in source apportionment modelling;
- Experience of running a global aerosol model;
- Understanding of atmospheric ice nucleation;
- Appreciation of high-latitude aerosol sources;
- Knowledge of aerosol emission, transport and removal processes;
- Knowledge of aerosol-cloud interactions;
- Experience running the UKESM or similar models.

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.

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.

Contact information

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

Professor Ken Carslaw, Lead on Global Aerosol Modelling
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Professor Stephen Arnold, Lead on Source Apportionment Modelling
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Professor Benjamin Murray, M-Phase Principle Investigator
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Additional information

You will be supported by the Centre for Environmental Modelling And Computation (CEMAC)

Find out more about the Faculty of Environment

Find out more about the School of Earth and Environment

Find out more about our Research and associated facilities

Find out more about equality in the Faculty

A diverse workforce
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 and ethnically



diverse people; people who identify as LGBT+; and people with disabilities. 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 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.