UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Cloud Modelling, Faculty of Environment

Salary: Grade 7 (£41,064 – £48,822 p.a. depending on experience)

Reporting to: Dr Tom Whale

Reference: ENVEE1867

Fixed term period: 24 months - To complete specific time limited work.

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

We are open to discussing flexible working arrangements

Research Fellow in Cloud Modelling, Faculty of Environment

Overview of the Role

Are you an ambitious atmospheric modeller ready to improve the representation of ice nucleation in weather and climate models? Do you have experience developing and running large numerical models and analysing complex datasets? Would you like to work with a world-leading team at Leeds to connect molecular-scale insight to cloud-scale prediction?

You will join the project "From Toy to Cloud Modelling: Leveraging Molecular Simulations to Improve Atmospheric Models of Ice Nucleation" (NERC APP25329). The project is developing physically motivated statistical "toy models" of heterogeneous ice nucleation and using them to improve parameterisations of ice-nucleating particles (INPs) in weather and climate models. Your focus will be the Leeds-based cloud-modelling work package: implementing new INP parameterisations derived from the toy models into a regional, cloud-resolving configuration of the Met Office Unified Model (UM) using the Cloud Aerosol Interacting MicroPhysics (CASIM) scheme, and quantifying the impacts on cloud microphysics, radiation and precipitation across a set of well-observed case studies (e.g. mixed-phase clouds at high latitudes and deep convection in marine and continental environments). You will work closely with colleagues at Leeds and Warwick (who are developing and validating the toy/atomistic models) to translate physically informed INP spectra into robust, computationally efficient parameterisations suitable for operational-scale modelling. The role provides an outstanding opportunity to develop expertise across aerosol–cloud interactions, model development and high-performance computing, while producing publishable research and contributing to knowledge exchange with the wider modelling community.

Main duties and responsibilities

- Developing, implementing and testing physically informed INP spectra/ice-nucleation parameterisations (from the project toy models) within the UM/CASIM framework;
- Designing, running and document ensembles of regional, cloud-resolving simulations (order-kilometre grid spacing) for targeted case studies, using University and partner high-performance computing facilities;



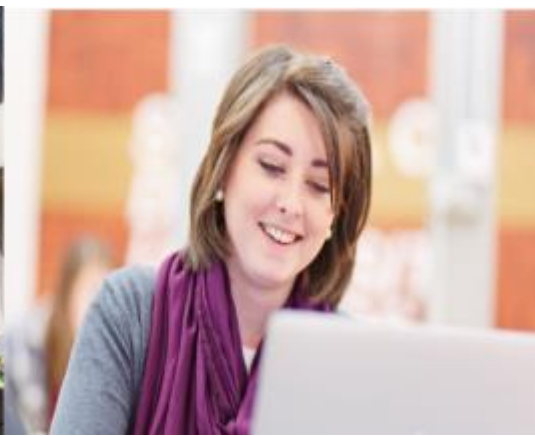
- Creating robust diagnostics and evaluation workflows to compare simulations against existing model experiments and observational datasets, and to quantify sensitivity of key cloud and radiative metrics to INP assumptions;
- Analyse and visualise large model datasets using appropriate scientific software, ensuring reproducible, well-documented workflows and data management in line with FAIR principles;
- Working collaboratively with the Warwick-based team to translate toy-model/atomistic outputs into parameter forms usable in cloud models, iterating based on model performance and physical plausibility;
- Disseminate findings through peer-reviewed publications, conference presentations, and contributions to project workshops and stakeholder engagement activities (including interactions with Met Office partners);
- 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.

Qualifications and skills

Essential

- A PhD (or near completion, with thesis submitted at the point of application) in atmospheric science, meteorology, climate science, physics, applied mathematics, or a closely related discipline, together with a strong background in atmospheric and/or cloud modelling, quantitative problem-solving, and the ability to conduct independent research;
- Proven experience in numerical modelling, scientific programming and data analysis/visualisation using appropriate tools (e.g. Fortran, C/C++, Python, MATLAB or R), including handling large datasets, alongside experience of





Linux/HPC environments and good software engineering practices such as version control, testing and documentation;
- A developing track record of peer-reviewed publications in international journals, or clear evidence of strong potential to publish original research at an international level;
- Excellent written, verbal and presentation skills, with the ability to communicate research effectively to a range of audiences;
- Strong organisational, time-management and planning skills, with the ability to manage competing demands, meet deadlines and work effectively both independently and as part of a team;
- A clear commitment to continuous professional development.

Desirable
- Experience of pursuing external funding to support 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 the Faculty of Environment.

Find out more about our School.

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 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.

Information for disabled candidates
Information for disabled candidates, 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.