UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Scientific Software Engineer in Earth System Modelling,

School of Earth & Environment/Faculty of Environment

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

Reference: ENVEE1860

Location: Met Office, Exeter (with scope for hybrid working)

Fixed-term for 3 years to complete specific time limited work.

We are open to discussing flexible working arrangements

Scientific Software Engineer in Earth System Modelling,

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Are you passionate about software development and its use in scientific research?

Are you keen to apply your expertise in programming to improve our ability to understand and predict the major risks associated with global climate change?

Would you like to work in a team developing the next generation of the UK global climate and Earth system models?

We seek a scientific software engineer (SSE) to work within the ARIA-funded, multi-centre project **PROMOTE** (Progressing Earth System Modelling for Tipping Point Early Warning Systems). The successful candidate will join the UKESM core team, contributing to the development and optimization of a new hybrid-resolution version of the 2nd UK Earth system model (UKESM2). The key aim of PROMOTE is to develop and apply a high-resolution ESM to investigate the risks, consequences, and potential interactions between abrupt changes in the North Atlantic subpolar gyre (SPG) and the Greenland ice sheet. The resulting modelling system may act as an early-warning system for abrupt change in both phenomena.

PROMOTE consists of 7 partner institutes: the universities of Leeds, Reading, Edinburgh and Bristol, as well as the Met Office, the National Oceanography Centre, and the British Antarctic Survey. Staff at Leeds and Reading are also members of the National Centre for Atmospheric Science (NCAS). The successful candidate will be fully integrated into this consortium, as well as becoming a member of the UKESM core development team. To increase integration with the UKESM team, while this is a University of Leeds position, **the successful candidate will be physically based at the Met Office in Exeter**, where the bulk of the UKESM team are located.

What does the role entail?

The role will entail a range of development activities to optimize computational performance of the new hybrid resolution model, consisting of multiple executables running in parallel, first on the new Met Office HPC (high-performance computing) system and then on the next UKRI/NERC HPC. Tasks include (i) determining and realizing an appropriate separation of science concerns between low and high model resolutions, (ii) developing efficient data communication between each resolution, (iii) optimization of individual model components, and (iv) optimization and load balancing of the full system, encompassing multiple model executables. An important requirement will be regular communication and coordination with other model development teams at the Met Office.

As a **Scientific Software Engineer**, your main duties will include:

- Contributing to the technical development of the hybrid resolution model, UKESM2-hybrid, with an emphasis on computational efficiency, robustness, and scientific integrity of the resulting systems.

- Contributing to optimizing the performance of this model on a range of HPC platforms.

- Working across the PROMOTE consortium to bring new science developments into UKESM2-hybrid and ensure their computational quality and performance.

- Providing technical support and advice to UKESM model users and developers both within and beyond the immediate UKESM core team, as required.

- Playing an active role in the PROMOTE consortium and the overall project activities. For example, working with project scientists to ensure their model developments are robust, efficient, and fully integrated into the UKESM code base.

- Maintaining an active commitment to your own continuing professional development.

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 **Scientific Software Engineer** you will have:

- A high level of proficiency in suitable programming languages e.g. Fortran, Python, Linux, MPI, C/C++, OpenACC
- Experience developing, running, testing and debugging numerical models
- Experience working with high performance computing (HPC) systems, including experience with tools to facilitate parallel code performance on HPCs.
- Significant experience in one of computer science, maths, physics, meteorology, oceanography or a closely related discipline.
- 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 ability to work well both individually and in a team.
- A strong commitment to your own continuous professional development.

You may also have:

- An advanced degree (e.g. PhD, MSc) in computer science, mathematics, or physics.
- Experience developing climate or Earth system models (including component models)
- Experience managing large data volumes
- Experience porting and profiling numerical models.
- Experience in the use of Git for version control
- Experience working with GPUs
- Experience of Machine Learning/AI

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.

Interview Date: mid-February

Contact information

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

Professor Colin Jones, Head of UK Earth System Modelling, Professor Colin Jones | School of Earth and Environment | University of Leeds
Tel: +44 782 690 3925
Email: colin.jones@metoffice.gov.uk

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.

As the candidate will be based at the Met Office building in Exeter, they will need to go through Met Office security clearance.

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 and Inclusion in the Faculty of Environment

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.

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