UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in African Sub-seasonal Weather Prediction, Faculty of Environment

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

Reporting to: Douglas Parker

Reference: ENVEE1828

Fixed term until 30 September 2027 to complete specific time limited work

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

We are open to discussing flexible working arrangements

Research Fellow in African Sub-seasonal Weather Prediction, Faculty of Environment

Overview of the Role

Are you an atmospheric scientist looking to apply your expertise to real-world forecasting challenges in Africa?

Machine-learning has the potential to revolutionise weather prediction in Africa, and we are seeking a scientist who understands and enjoys challenges in atmospheric and climate dynamics, weather prediction and predictability. You will take a lead on the deployment and evaluation of a new generation of machine learning-based sub-seasonal weather forecasts for African agriculture.

The Cumulus project is a consortium of UK and African partners funded by the Gates Foundation, which aims to make a breakthrough in the application of machine-learning forecasting methods for West African agriculture. The project is led by the UK's Alan Turing Institute, with partners in Senegal and Ghana, and all partners will collaborate closely. We will also be part of an over-arching project – Nimbus – linking with US and East African teams and other international specialists.

Within Cumulus, you will lead the application and evaluation of sub-seasonal (2-4 week) forecasts. Other members of the team will be developing innovative machine-learning methods for global sub-seasonal prediction and downscaling for Africa. We aim to get the first models developed rapidly, and you will support work to ensure that the methods can be run, evaluated and improved by partners in African universities and weather services.

A significant part of your work, in collaboration with the African groups, will be to understand how to create and evaluate forecasts of highest priority to farmers (such as rainfall onset prediction) from the machine-learning derived products. We aim to understand the predictability of these forecasts as a function of lead time, spatial scale and the controlling physical processes or phenomena. You will also lead on the evaluation of the forecasts according to known physical drivers and constraints, such as tropical wave modes, feedback with the land surface and response to global sea surface temperatures. From these insights into climate dynamics in the machine-



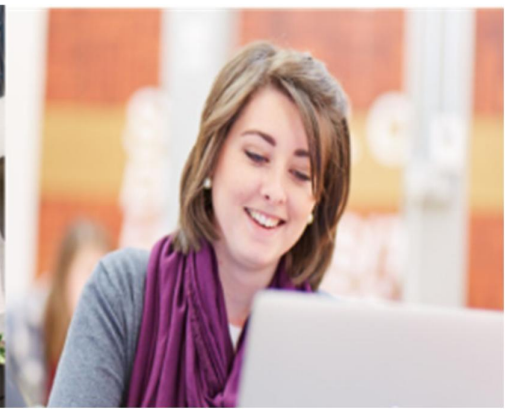
learning predictions, we aim to understand drivers of predictability: are there “windows of opportunity” of high predictive skill which may benefit farmers?

Main duties and responsibilities

- Contributing to the design and application of machine learning-based forecasting and downscaling tools for West Africa;
- Working with African partners to identify and refine the appropriate forecast products and metrics;
- Working with African partners to support the implementation of the forecasting and downscaling tools in operational forecasting centres in Senegal and Ghana;
- Generating and pursuing independent and 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 continuation funding in collaboration with colleagues;
- Leading the evaluation of the performance of ML-based forecasting and downscaling methods, using advanced physics and mathematics-based analysis, and comparing with existing forecasting benchmarks;
- 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 in the UK and Africa, 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.

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.





Qualifications and skills

Essential

- A PhD or near completion (must be submitted prior to starting in post) in Meteorology, Physics, Mathematics, Fluid Dynamics or a closely allied discipline;
- A strong background in the following: (1) computational data analysis and modelling in a unix environment, (2) atmospheric dynamics, and (3) mathematical insight required to conduct advanced forecast evaluation;
- Evidence of excellent scientific thinking, applicable to predictability of weather systems. Your experience could be in another area of atmospheric science, but you must have skills and experience which can be applied to analyse, understand and work creatively in evaluating forecasts and understanding their skill;
- Good time management and planning skills, with the ability to meet tight deadlines to bring research to a successful conclusion, manage competing demands and work effectively under pressure without close support;
- A developing track record of peer reviewed publications in international 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 and supporting other colleagues in their professional development;
- Willingness to travel to Africa to collaborate with partners in the region.

Desirable

- Experience of pursuing external funding to support research;
- Experience of African or tropical meteorology;
- Statistical methods for evaluation of weather forecasts;
- Evidence of ability to set up pipelines of real-time data for sharing and external communication.

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.

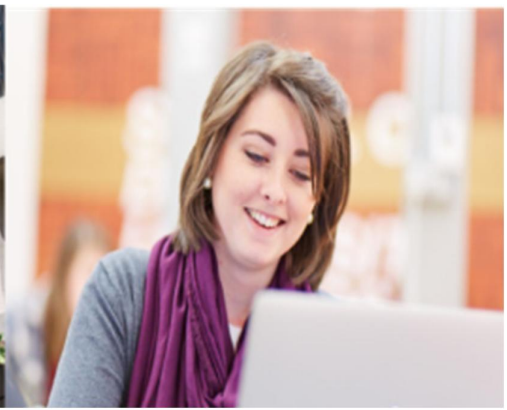
Find out more about Equality in the Faculty.

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.