UNIVERSITY OF LEEDS

Faculty of Environment
School of Earth and Environment

Research Fellow in modelling African Climate Dynamics:
Integrating Hydro-Climate Science into Policy Decisions for Climate-Resilient Infrastructure and Livelihoods in East Africa (HyCRISTAL) project

Fixed term for 36 months - available immediately

Job sharing arrangements can be considered

We seek an ambitious scientist with interests in atmospheric dynamics and climate change to study the role of moist convection in the climate system of East Africa and the implications for projections of change. Many aspects of climate projections for East Africa are uncertain, in particular for rainfall, floods and droughts, and the rapidly growing population is vulnerable to such changes.

You will be a part of the international HyCRISTAL consortium that is led from Leeds and has members in East Africa, the UK and the USA. You will use kilometre-scale convection-permitting simulations of current and future African climate, run within the DfID-NERC "Future Climate for Africa" (FCFA) programme, to understand future extreme rainfall and dry spells in East Africa and how the representation of convection in models affects regional circulations and climate projections. You will work with the HyCRISTAL team, and others in FCFA, to address FCFA's aims of reducing uncertainty in the projections of African climate on the 5-40 year timescale, and making better use of climate information for improved decision-making for those time-scales. Please see the full job description for further information on the HyCRISTAL project.

You will have a PhD (or be close to obtaining) in a quantitative physical science, such as Atmospheric Science, Physics, Applied Mathematics or Meteorology, and have experience of handling large volumes of numerical model data. You will be used to programming on a Unix/Linux operating system and have excellent communication skills, and be willing to collaborate actively with project partners including undertaking travel to partners in the UK and Africa.

The University of Leeds' commitment to women in science has been recognised with a national accolade. The University has received the Athena Swan Bronze Award in recognition of our success in recruiting, retaining and promoting women in Science, Engineering and Technology (SET). The Faculty of Environment are in the process of preparing an application for an Athena Swan award to recognise our commitment and work in these areas.

The University also offers family friendly policies including generous maternity and paternity leave; full details of the policies can be found here http://hr.leeds.ac.uk/homepage/4/policies

University Grade 7 (£31,656 - £37,768 p.a.)

Informal enquiries may be made to Dr John Marsham, email J.Marsham@leeds.ac.uk, tel +44 (0)113 343 6422

Closing Date: 10 January 2016

Ref: ENVEE1088

Click here for further information about working at the University of Leeds www.leeds.ac.uk/info/20025/university_jobs

Job Description

Responsible to: Head of School
Reports to: Dr John Marsham

Details of the HyCRISTAL project and the role

The £4M HyCRISTAL consortium is one of five consortia within the FCFA programme. It is working with the HyNEWS programme, which is supported by the World Meteorological Organisation. You will be joining other climate-researchers working on FCFA at Leeds, as well as a much larger group working on tropical weather and climate. You will therefore be part of a large collaborative research team, which includes expertise in East Africa climate change, observations, modelling and tropical meteorology, as well as interacting with colleagues with expertise in impacts of climate change, engineering and economics. You will have close collaboration with colleagues at Leeds, the Met Office and elsewhere, especially those working in the IMPALA (Improving Model Processes for African cLimAte) project, which is supplying most of the model data for HyCRISTAL. You will communicate effectively throughout the project with those researching climate-change impacts, to ensure a two-way flow of information, participate in at least annual meetings in East Africa and help host visiting scientists from East Africa.

This project presents a unique opportunity: the multi-year convection-permitting numerical simulations to be used in HyCRISTAL represent a step-change in our ability to model tropical rainfall, an outstanding research challenge of global significance. The results will be used to improve our theoretical and conceptual understanding of climate change and climate variability in the tropics, and will influence the interpretation of climate predictions at local level. The models and their interpretation will also be used to drive collaborative work on physical, ecological and socio-economic impacts of climate change in the region, with our partners conducting studies on impacts on rural livelihoods and urban water supply and sanitation in particular. You will contribute to our understanding of how global climate change has impacts on local and regional climate of Africa. There is the potential for a number of important publications arising from the work. We aim that the results will increase confidence in model climate projections for Africa, and will influence methods and policies for exploitation of climate projections in tropical continental regions.

You will be expected to contribute to the ongoing research in atmospheric science in the School. Your work will lead to significant publications in atmospheric and climate science and you will also present your research at national and international meetings. You will communicate outcomes of the research to relevant stakeholders outside academia.

Main duties and responsibilities

- Undertake original research into the role of moist convection in climate-change in East Africa. Use this new understanding of how the representation of convection affects circulation, teleconnections, land-atmosphere coupling and extremes to determine implications for climate projections
- Work with project partners to analyse numerical model simulations using Met Office models at a range of resolutions, and other models as appropriate
- Use advanced and innovative model analysis and diagnostic techniques, to analyse the numerical model data from the IMPALA project, and other simulations as appropriate
- Develop and test scientific hypotheses (possibly also including development of conceptual models)
- Work with other HyCRISTAL consortium members to make use of new surface-flux observations to evaluate models
- Develop collaborations with colleagues within HyCRISTAL, and develop new external research links where possible
- Assist other HyCRISTAL consortium members in their use and interpretation of the model data, notably in the areas of impacts modelling and socio-economic analysis
- Disseminate research results by presentation at national and international meetings, maintenance of web-based information, and preparation of manuscripts for publication
- Plan and manage own research activity in collaboration with others
- Use initiative and creativity to identify areas for research, develop new research methods and extend the research portfolio
- Contribute to the management of the HyCRISTAL project at the University of Leeds, for instance helping to organise meetings and maintain web pages
- Collaborate with colleagues working on other FCFA regional projects at Leeds and externally, and provide leadership in the analysis of the high-resolution model data where appropriate
- Identify other research project opportunities and directions as they arise, and assist in the writing of grant proposals
- Interact with, and provide assistance to, other staff in the research group at Leeds
- Where there is the opportunity and where this does not impede the research progress, contribute to teaching activity, for example by contributing to lectures, tutorials and/or seminars, developing and updating the content of these sessions as appropriate to help develop student research skills
- Any other duties as may reasonably be required, consistent with the grade of the post

The School of Earth and Environment is a green impact award holder, and expects all staff to go about their duties in a resource efficient way, minimising impacts to the environment wherever possible

Career Expectations

The University of Leeds is committed to developing its staff. All staff participate in the Staff Review and Development scheme and we continue to work with individuals, supporting them to maximise their potential.

Progression to a higher grade is dependent on an individual taking on an increased level of responsibility. Vacancies that arise within the area or across the wider University are advertised on the HR website - http://jobs.leeds.ac.uk - to allow staff to apply for wider career development opportunities.

University Values

All staff are expected to operate in line with the University's values and standards, which work as an integral part of our strategy and set out the principles of how we work together. More information about the University's strategy and values is available at http://www.leeds.ac.uk/comms/strategy/.

The School of Earth and Environment is a green impact award holder, and expects all staff to go about their duties in a resource efficient way, minimising impacts to the environment wherever possible

Person Specification

Essential

- A PhD (or be close to obtaining) in a quantitative physical science, such as Atmospheric Science, Physics, Applied Mathematics or Meteorology
- Experience of handling large volumes of numerical model data
- Interest in tropical climate dynamics, with the potential to develop creative new approaches in this field
- An excellent track record of publication in high-quality journals
- Experience in scientific programming, including numerical modelling
- Experience with the Linux or Unix operating systems
- Excellent communication skills
- Ability to work in a team and independently
- Ability to collaborate with external partners
- Evidence of innovation in research
- Excellent organisational skills and a flexible approach
- Willingness to undertake travel to partners in the UK and Africa

Desirable

- Knowledge of the dynamics of convective rainfall
- Experience with running numerical models of the atmosphere
- Knowledge of tropical climate change processes

Additional Information

The University offers generous terms and conditions of employment, a wide range of benefits, services, facilities and family friendly policies. Full details are available on the Human Resources web pages accessible at www.leeds.ac.uk/hr

The Partnership

The Partnership has been developed by students and staff and describes the mutual expectations of us all as members of the University of Leeds community. More information about the Partnership is available at http://partnership.leeds.ac.uk

Disclosure and Barring Service checks

A Disclosure and Barring Service (DBS) Check is not required for this position. However, applicants who have unspent convictions, cautions, reprimands and warnings, including any pending criminal proceedings must indicate this in the 'other personal details' section of the application form and send details to the Recruitment Officer at disclosure@leeds.ac.uk.

Disabled Applicants

The post is located in the School of Earth and Environment. Disabled applicants wishing to review access to the building are invited to contact the department direct. Additional information may be sought from the Recruitment Officer, email disclosure@leeds.ac.uk or tel + 44 (0)113 343 1723.

Disabled applicants are not obliged to inform employers of their disability but will still be covered by the Equality Act once their disability becomes known.

Further information for applicants with disabilities, impairments or health conditions is available in the applicant guidance.

Further Particulars

The University of Leeds is one of the largest universities in Britain, with over thirty thousand students and more than six thousand staff, including over two thousand academic and academic-related staff. The University has departments in all major disciplines and is committed to developing a number of research areas as world class centres of excellence. This has involved identifying a number of `gold peaks' of high quality research and developing strategic investment initiatives for these areas to enable them to develop further. The University has recently invested over £25 million in a new and refurbished buildings for the School of Earth and Environment.

School of Earth and Environment

The School of Earth and Environment is established as one of the leading centres of international excellence across the Earth and Environmental Sciences. In the UK REF 2014, we ranked 5th out of 44 departments in the UK for overall research quality in Earth systems and environmental sciences. We have been rated as one of UK's top 2 centres for research power and 90% of our research has reached world leading and internationally excellent standards based on overall quality. The School comprises ~120 academic staff and +100 postdoctoral researchers. In 2014/15 we attracted £14.6million in research funding and this figure is expected to exceed £21 million in 2019/20.

Institute of Applied Geosciences

The recently established Institute of Applied Geosciences promotes and supports world-class applied-facing research focused on energy, environmental and industrial applications of geoscience leading to high-quality publications, strong impact case studies, enhanced income, attraction and training of top-quality students, enhancement of research-led teaching for employment orientated UG and PG courses. IAG comprises a group of scientists researching fundamental geoscience with application and impact towards energy, environmental, industrial and infrastructural problems. IAG has a diverse research base, strong international profile and is highly multi-disciplinary. The institute comprises of five core research groups: Sedimentology Group, Geomechanics, Engineering and Petrophysics

Earth Surface Science Institute

This is an institute of earth science researchers with a broad range of expertise falling into four natural groupings: Process Sedimentology; Paleontology; Environmental Geochemistry; and Engineering Geology and Hydrogeology. Research endeavours encompass the study of past and present environmental and climatic conditions and the processes that control them and produce change. Thus, we model river and turbidity current flow dynamics, study deep-sea vent communities, quantify groundwater systems, constrain nutrient fluxes in oceans, assess the causes of ancient mass extinctions and much more. Work ranges across all scales from the microscopic study of mineral growth and weathering to the global-scale study of iron cycling and the sulphur isotopic system of the oceans. The Institute also includes a strong group working on Engineering Geology and

Hydrogeology whose interests overlap the Geochemists in the field of contaminated land and groundwater.
http://www.see.leeds.ac.uk/research/essi/

Institute of Geophysics and Tectonics

The Institute of Geophysics and Tectonics is dedicated to understanding the structure and evolution of the Earth and neighbouring planets. Detection and measurement of resources in the crustal layer and understanding of geological hazard also are principal aims. Measurement of gravity, magnetism, seismic waves and electrical properties, theoretical and computer modelling, surface structural mapping and petrological studies all contribute to these goals. Recently, in collaboration with the Faculty of Engineering, we have expanded applied research in petroleum engineering, seismology and structural geology.
http://www.see.leeds.ac.uk/research/igt

Institute for Climate and Atmospheric Science

ICAS, in the School of Earth and Environment at the University of Leeds, is an established and expanding group, representing one of the largest and most active Atmosphere and Climate research teams in Europe. We have around 100 research-active members, whose programme covers Atmospheric Dynamics, Aerosols, Cloud Microphysics, Atmospheric Composition and Climate Change. In each of these areas, the Institute makes use of theoretical and numerical modelling on the full spectrum of scales, from cloud microphysics to global dynamics and chemistry. We maintain a long-term commitment to field measurement of atmospheric phenomena, including aerosols and chemistry as well as the physics and dynamics of weather systems. We also have well-established research collaborations with several UK and international agencies, including the Met Office, and we host the Directorate of the UK National Centre for Atmospheric Research (NCAS).
http://www.see.leeds.ac.uk/research/icas

The Sustainability Research Institute

As a key part of the School of Earth and Environment, the Sustainability Research Institute (SRI) is home to a team of over 30 academic staff and 35 research students conducting inter-disciplinary research on the different dimensions of sustainability. Research within SRI is based largely on the environmental social sciences and draws upon aspects of geography, sociology, politics, planning, economics, management, development studies and science and technology studies. Our broader activities combine social and natural sciences in leading-edge, interdisciplinary research. SRI has received significant research funding from various sources, including the recent award of £5.5 million from the ESRC to establish the Centre for Climate Change Economics and Policy (in partnership with the LSE). As well as being a centre of excellence for inter-disciplinary research, SRI runs a range of postgraduate and undergraduate programmes on the different dimensions of sustainability.
http://www.see.leeds.ac.uk/research/sri

Research Laboratory Facilities

The School of Earth and Environment has recently invested in newly commissioned geochemical and atmospheric science laboratories as part of the new build. These world class research facilities embrace all aspects of earth and environmental science including atmospheric instrument and chemistry labs, laser facilities, geomicrobiology-, geochemistry instrument-, isotope geochemistry-, hydrochemistry-, clean- and radiochemistry- labs. Further, the co-location of these facilities in the new School facilitates access to a wide range of analytical services including ICPMS, XRD, IC and isotope analysis.
http://www.see.leeds.ac.uk/research/facilities/

Student Education Service

The School of Earth and Environment has a student population approaching 1000. We offer a wide range of undergraduate and MSc programmes within the broad areas of Earth Sciences, Environmental Science and Sustainability. We also an MRes course and have a vibrant PhD community.

Our learning and teaching strategy is to:

1. Recruit and train excellent students who go on to beneficially impact society
2. Deliver distinctive, high quality, research based programmes, embedded in excellent practice
3. Provide an exceptional student experience and a thriving academic community

This strategy is delivered through high quality teaching supported by state-of-the-art equipment, facilities and resources. Strong links are made between research and teaching throughout the programmes, but in particular during projects and fieldwork.
http://www.see.leeds.ac.uk/study/undergrad/
http://www.see.leeds.ac.uk/study/masters/
http://www.see.leeds.ac.uk/study/phd/