Faculty of Environment
School of Earth and Environment
Institute for Climate and Atmospheric Science

Research Fellow in Global Aerosol Modelling

Fixed term for 11 months

You will contribute to the Monitoring Atmospheric Composition and Climate (MACC-II) research project. The MACC (Monitoring Atmospheric Composition and Climate) and MACC-II projects are major consortia since 2009 involving over 40 partner institutions across Europe funded via the EU Framework Programme 7. The current MACC-II project will deliver the atmospheric component "Copernicus" of the Global Monitoring for Environment and Security (GMES) system to provide re-analyses of atmospheric composition for recent years, monitor present conditions and forecast the distribution of key constituents for a few days ahead.

You will be required to carry out analysis/visualisation of output from simulations with C-IFS-GLOMAP and IFS-GLOMAP and evaluating model skill against a range of benchmark observational datasets. The scientific aspects of the project will involve assessing the improvement in the aerosol model with the coupling to the atmospheric chemistry. The research will also quantify the impact of resolving aerosol-chemistry interactions such as heterogeneous chemical reactions and aerosol impacts on photolysis.

You will have a PhD (or be close to obtaining one) and research interests in atmospheric modelling, with expertise either in atmospheric chemistry/aerosol processes or modelling of other complex systems. You will have proven skills in numerical modelling in fortran and data visualisation/analysis techniques. You must have a demonstrable commitment to publication of research findings at an international level, as your role will involve leading a peer-reviewed journal article.

University Grade 7 (£30,424 - £36,298 p.a.)

Informal enquiries may be made to Dr Graham Mann, tel +44 (0)113 343 8668, email g.w.mann@leeds.ac.uk.

Closing Date: 3 July 2013

Ref: ENVEE0167

Job Description

Responsible to: Head of School
Reports to: Dr Graham Mann

Main Duties and Responsibilities

- Development and analysis/visualization of output from complex global aerosol and numerical weather prediction models

- Interpretation of findings of model evaluation against observations from satellite and ground-based monitoring datasets

- The publication of the results in high quality, peer reviewed journals or other appropriate outlets

- Transform and apply knowledge acquired from the project by presenting results at national and international meetings

- Co-supervision of research students in the global aerosol modelling group

- Pro-actively networking with other researchers both internally and externally to share information and make contacts for future collaboration

- Plan and manage your own research activity in collaboration with others in the School and within the strategy identified for the research group

- Contribute to the development of follow-on research funding applications/ contribute to proposals for other research opportunities where appropriate

- Use initiative and creativity to identify areas for research, develop new research methods and extend the research portfolio

- Carrying out any other duties commensurate with the grade and purpose of the post as directed by Head of School

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/strategy/.

Person Specification

Essential

- You will have a PhD (or be close to obtaining one) and research interests in atmospheric modelling with expertise either in chemistry/aerosol processes, or modelling of other complex systems

- Proven skills in numerical modelling in fortran

- A demonstrable commitment to publication of original results at an international level

- Enthusiasm for collaboration with colleagues within the Institute for Atmospheric Science and at UK and international institutes

- Excellent organisational skills

- Effective communication skills

- The capacity to be flexible when appropriate

- Proven ability to use own initiative

Desirable

- Experience of handling large and complex datasets

- Experience of running chemistry transport models or general circulation models on supercomputing environments

- A good understanding of data assimilation techniques (e.g. 4dVAR)

Additional Information

Details of the terms and conditions of employment for all staff at the University, including information on pensions and benefits, are available on the Human Resources web pages accessible at http://hr.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 must indicate this in the 'other personal details' section of the application form and send details to the Recruitment Officer.

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 information about the project

The MACC (Monitoring Atmospheric Composition and Climate) and MACC-II projects are major consortia since 2009 involving over 40 partner institutions across Europe funded via the EU Framework Programme 7. The current MACC-II project will deliver the atmospheric component "Copernicus" of the Global Monitoring for Environment and Security (GMES) system to provide re-analyses of atmospheric composition for recent years, monitor present conditions and forecast the distribution of key constituents for a few days ahead.

MACC-II combines state-of-the-art atmospheric modelling with Earth observation data to provide information covering European air quality, global atmospheric composition, climate forcing, the ozone layer and UV and solar energy, and emissions and surface fluxes.

Within MACC, Leeds researchers have already implemented the size-resolved Global Model of Aerosol Processes (GLOMAP; http://www.researchpages.net/glomap) into the forecasting and reanalysis system (IFS) maintained by the European Centre for Medium Weather Forecasting. As well as aerosol forecasts, within MACC the IFS has been extended with a chemistry module (C-IFS) to forecast concentrations of reactive gases (e.g. ozone, nitrogen oxides). A new C-IFS-GLOMAP system combining the MACC-II aerosol and chemistry modules has now been assembled to provide a fully integrated state-of-the-science atmospheric composition forecasting system.

The post will involve analysis/visualisation of output from simulations with C-IFS-GLOMAP and IFS-GLOMAP and evaluating model skill against a range of benchmark observational datasets. The scientific aspects of the project will involve assessing the improvement in the aerosol model with the coupling to the atmospheric chemistry. The research will also quantify the impact of resolving aerosol-chemistry interactions such as heterogeneous chemical reactions and aerosol impacts on photolysis.

The post will be based in the School of Earth and Environment within the aerosol modelling group (http://www.see.leeds.ac.uk/aerosol/) which is carrying out a range of research topics, including volcanic impacts on climate and air quality, modelling aerosol-cloud interactions and quantifying uncertainty in aerosol-climate models

The University of Leeds

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 £23 million in a new/refurbished building 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 RAE 2008, we ranked second nationally in terms of research power (the amount of internationally excellent and world-leading research outputs) for Earth and Environmental Sciences. The School comprises +90 academic staff and +80 postdoctoral researchers. In 2011/12 we attracted £11.2million in research funding and this figure is expected to exceed £13 million in 2014/15.

The School mission is "*to lead internationally in research, to deliver a high quality of learning and teaching in Earth and Environmental Sciences and hence to beneficially impact society*". This is supported by a School Strategy that aims to achieve international recognition for frontier research of global impact and influence and by building strong dynamic academic communities across the School. Strong research – teaching linkages are central to this aim with the School being home to over 1,000 students spread across a portfolio of undergraduate, masters and PhD programmes.

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/business-and-consultation/facilities/

Learning and Teaching

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 offer two MRes courses and have a vibrant PhD community.

Our learning and teaching strategy is to:

- Create learning opportunities for students to engage with Earth and Environmental research excellence

- Provide an exceptional student experience by delivering distinctive high quality modules and building academic communities

- Enhance student employability through building key skills and experience

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/