



UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Modelling of the Upper Atmosphere,
Faculty of Engineering & Physical Sciences



Salary: Grade 7 (£33,797 – £40,322 p.a.)

Reference: EPSCH1017

Closing date 28 May 2020

Fixed-term for up to 36 months, available from 1st June 2020

We will consider job share / flexible working arrangements

Research Fellow in Modelling of the Upper Atmosphere, School of Chemistry.

Do you want to play a key role in developing a leading global chemistry-climate model to include the crucial role of small-scale gravity waves in the transport of chemical constituents? Would you enjoy working with an international team from the UK, US, China and Japan in achieving this goal?

We are looking for an enthusiastic and motivated researcher to join the Atmospheric and Planetary Chemistry group within the School of Chemistry. The WAVECHASM (Wave-Induced Transport of Chemically Active Species in the Mesosphere and Lower Thermosphere) project, funded by the [NERC](#) in the UK and the NSF in the US, will bridge the gap between high-resolution regional models and global climate models in representing transport of constituents by gravity waves. It will contribute to a much deeper understanding of the key small-scale wave-induced constituent transport processes (advection, turbulent mixing, dynamical transport and chemical transport), their global characteristics and their impact on atmospheric chemistry.

By making use of a recent novel theoretical approach and developing this to incorporate these transport processes into global atmospheric chemistry models, this project will significantly enhance our ability to simulate the global constituent structure of the upper atmosphere. We will focus on the mesosphere and lower thermosphere (MLT, between 70 and 120 km), which is sensitive to upward propagating atmospheric waves from below, and solar radiation and energetic particle precipitation (i.e. space weather) from above, and is where interplanetary dust particles ablate. This role will be based at the University of Leeds (UK) but you will be expected to visit our project partners at the University of Colorado (Boulder, USA) twice during the project, for two weeks at a time.

You will have a PhD (or have submitted your thesis before taking up the role) in meteorology, atmospheric physics, atmospheric chemistry, applied mathematics, geophysics or a closely allied discipline, together with a strong background in computer programming, code development and using large numerical codes and/or datasets. Experience of working directly on research problems related to the earth's mesosphere and lower thermosphere would be beneficial.



What does the role entail?

As a Research Fellow, your main duties will include:

- Working with a regionally-refined version of the Whole Atmosphere Community Climate Model (WACCM) from the US National Center of Atmospheric Research (NCAR), to determine the effects on composition of resolving a greater portion of the full spectrum of atmospheric waves;
- Working with Professor Chester Gardner (University Illinois, USA) to develop and integrate a new small-scale wave transport parameterization into a standard resolution version of WACCM;
- Working with project partners Professor Xinzhao Chu (University of Colorado, USA), Professor Alan Liu (Embry-Riddle University, USA), Professors Xianghui Xue and Tao Li (University of Science and Technology, China), Dr Guotao Yang (National Space Science Centre, China), and Dr Satonori Nozawa (Nagoya University, Japan) to compare the model results against a network of ground-based lidar and satellite observations;
- Generating and pursuing independent and original research ideas in atmospheric science;
- Developing research objectives and contributing to setting the direction of this research project and preparing proposals for funding in collaboration with colleagues;
- Preparing papers for publication in leading international peer-reviewed 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.

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 Research Fellow, you will have:

- A PhD (or have submitted your thesis before taking up the role) in meteorology, atmospheric physics, atmospheric chemistry, applied mathematics, geophysics or a closely allied discipline;
- A strong background in computer programming, code development and using large numerical codes and/or datasets;
- 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 track record of peer-reviewed publications in high impact factor 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.

You may also have:

- Experience of working directly on research problems related to the earth's mesosphere and lower thermosphere;
- An understanding of atmospheric gravity waves and their impacts on the atmosphere;
- Experience of working with “whole atmosphere” models and/or the NCAR Community Earth System Model;
- Experience of working with data sets produced from satellite observations of atmospheric constituents;
- Experience in FORTRAN programming;
- Experience of pursuing external funding to support research.

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.



Contact information

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

[John Plane](#), Professor of Atmospheric Chemistry and PI of WAVECHASM

Tel: +44 (0)113 3438044

Email: j.m.c.plane@leeds.ac.uk

[Daniel Marsh](#), Priestley Chair in Comparative Planetary Atmospheres

Tel: +44 (0)113 343 9296

Email: d.marsh@leeds.ac.uk

[Wuhu Feng](#), NCAS Scientist

Tel: +44 (0)113 3433438

Email: w.feng@leeds.ac.uk

In addition to the University of Leeds investigators, interested candidates may also want to contact the US investigators:

Professor Chester Gardner, PI of WAVECHASM

Email: cgardner@illinois.edu

Professor Xinzhao Chu, co-I of WAVECHASM

Email: xinzhao.chu@colorado.edu

Additional information

Faculty and School Information

Further information is available on the research and teaching activities of the [School of Chemistry](#), [Physics and Astronomy](#), and [Earth and Environment](#), and [National Centre for Atmospheric Science](#).

A diverse workforce

The Schools in the Faculty of Engineering & Physical Sciences are proud to have been awarded the Athena SWAN [Bronze](#) or [Silver](#) Award from the Equality Challenge Unit, the national body that promotes equality in the higher education sector. Our [equality and inclusion webpage](#) provides more information.



Working at Leeds

Find out more about the benefits of working at the University and what it is like to live and work in the Leeds area on our [Working at Leeds](#) information page.

Candidates with disabilities

Information for candidates with disabilities, impairments or health conditions, including requesting alternative formats, can be found on our [Accessibility](#) information page or by getting in touch with us at disclosure@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 page.

