



UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Computational Electromagnetic Modeller

National Centre for Atmospheric Science



Salary: Grade 6 (£27,511 – £32,817, pro rata)

Reference: ENVEE1372

Closing date: 3 January 2020

Part time (0.9 FTE), fixed term for 6 months, to start on 1 January 2020

We will consider job share / flexible working arrangements

Computational Electromagnetic Modeller National Centre for Atmospheric Science (NCAS)

Are you a motivated and ambitious physicist or mathematician? Do you have experience in 3D modelling and computer programming? Are you enthusiastic and ambitious with a desire to be part of an interdisciplinary team delivering world-leading research that aims to help improve our understanding of the planet and help the public?

An exciting opportunity exists for someone with a physics or mathematical background to work within the National Centre for Atmospheric Science's (NCAS) Weather Radar Group at the University of Leeds. Our group makes extensive use of weather radars (which measure rain and clouds as well as insects and birds) to help improve our understanding of the environment.

Weather radar scan the entirety of the UK every 5 minutes, and similar types of radar are used around the world for the same purpose. Such radar routinely observes insects and other animal life in the atmosphere, but since animals are not of interest to meteorologists, they are discarded as unwanted "noise". That "noise" is a veritable treasure trove of information on insect diversity and abundance, but what is required is a way to link what a radar sees to the insects that we wish to monitor. This interdisciplinary post is designed to assess to what extent weather radar data can generate useful biological information that can be applied to solve contemporary ecological problems. To do this, you will characterise the electromagnetic properties of key invertebrate morphotypes by conducting a series of electromagnetic simulations on insect samples that have been scanned with a micro-CT.

You will need to have some knowledge of radar or atmospheric science; more importantly, you will need to be comfortable working with high-performance computing facilities and 3D modelling. You will work collaboratively with current team members who have extensive scientific knowledge but need your advanced technical skills to accomplish the team's goals efficiently. Specifically, the work will include the use of 3D modelling software, state-of-the-art set of computational electromagnetic modelling techniques and radar simulation algorithms on a local high-performance GPU driven workstation to create a world-leading dataset of the electromagnetic scattering properties of insects.



What does the role entail?

As Computational Electromagnetic Modeller your main duties will include:

- Contributing to developing, implementing, testing and documenting a suite of software to create a toolset that transforms microCT scans of insects into the electromagnetic scattering properties of these insects. The experts in our existing team will support this work. The goal will be to create an efficient workflow that utilises our computing facilities;
- Using this newly develop toolset, contribute to the understanding morphological parameter space of the scanned insects to determine the details necessary to include in the calculations performed when forming our final database (i.e. what resolution do we need to include in our calculations? Do we need to include the wings). This work will be reviewed by experts in our team and decisions will be made as a team about the best plan for creating the final database;
- Using the tool and knowledge of the parameter space to create a coherent database of the electromagnetic scattering parameters of all the insects scanned as part of the BioDAR project that is easily read by the radar simulation algorithms.

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 Computational Electromagnetic Modeller you will have:

- A degree or equivalent qualification in a computer/physical science subject, or equivalent professional experience;
- Experience in programming, processing 3D data and high-performance computing;
- Demonstrable ability to design, write and understand complex code in Python, R or Matlab in a Windows and/or Linux environment;
- Experience of working effectively with others;
- Excellent communication skills and a demonstrable capability to communicate technical information to non-specialists, verbally and in writing;



- Ability to produce a good quality plan and technical implementation of an IT or software concept;
- Ability to be pro-active, to work on own initiative and to adopt a flexible approach to achieving work outputs when required;
- Willingness to travel between NCAS sites and project locations.
- A basic understanding of the principles of remote sensing;

You may also have:

- Experience in 3D CAD modelling;
- Experience with NERC's JASMIN (<http://www.jasmin.ac.uk>) or equivalent.

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.

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

Dr Ryan Neely

Email: ryan.neely@ncas.ac.uk

Additional information

Find out more about the [National Centre for Atmospheric Science](#)

Find out more about the [Faculty of Environment](#)

Find out more about [Athena Swan](#) in the Faculty

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.

