## CANDIDATE BRIEF

## Research Fellow in Firn Modelling, Faculty of Environment



**Salary: Grade 7 (£37,099 – £44,263 p.a. depending on experience)**

**Reporting to: Professor Duncan Quincey**

**Reference: ENVGE1236**

**Fixed term for 24 months to complete specific time limited work**

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

**We are open to discussing flexible working arrangements**

# Overview of the Role

We are looking to recruit an independent and ambitious Research Fellow on the NERC-funded project, Losing their Cool, which aims to investigate the physical interactions between the atmosphere and the glacier surface at high-elevation (>6,000 m a.s.l.) in the Everest region of Nepal. The project is seeking to understand the processes that determine ice temperatures at the point of formation, with melting and refreezing in the accumulation area being a possible explanation for the surprisingly warm ice temperatures observed previously at lower elevations. To help test this hypothesis, we are seeking a numerical modeller, who can combine field observations of conditions within the firn with physically-based simulations of key subsurface processes to evaluate the role of melting and refreezing in prescribing glacier characteristics.

The project will focus primarily on the accumulation area of the Khumbu Glacier, in the Western Cwm of Mount Everest, building on the team's previous experience drilling in the lower part of the glacier, below the icefall. This time, the team will drill and instrument shallow boreholes using an ice corer, to measure englacial firn and ice temperatures, and image the interior of the boreholes to characterise firn density and quantify the magnitude and frequency of previous re-freezing events. The Research Fellow will use these empirical data to drive a numerical model that can simulate both the energy fluxes driving warming at the surface, and the consequent subsurface meltwater flow and refreezing processes. These data will enable us to isolate the impact of meltwater re-freezing on ice temperature, and determine the extent to which this changes in a warming climate.

The Research Fellow will be based in the School of Geography at Leeds, but will work closely with a second Research Fellow at Aberystwyth University, and with project partners in Uppsala and Bergen, to ensure the field observations are effectively integrated with the numerical modelling experiments. It is essential that the successful applicant has experience of, and/or enthusiasm for developing skills in numerical modelling of the surface energy balance and processes within the snowpack. The Research Fellow will lead all aspects of the firn modelling, including its calibration for the specific field site, sensitivity testing to quantify uncertainties, and validation of the model outputs against the field observations. Strong analytical skills are essential. The post includes an allocation of funds for conference attendance and we anticipate the Research Fellow will lead several high quality publications.

The post is available from 1 October 2024, or as soon as possible thereafter, for a period of 24 months, and will be based in the River Basins, Processes and Management cluster in the School of Geography at Leeds.

## Main duties and responsibilities

- Refining existing firn modelling approaches for application in the accumulation area of the Khumbu Glacier in Nepal;
- Working alongside project colleagues in Aberystwyth to ensure field data collection is informed by, and informs, the firn modelling experiments;
- Simulating firn processes under a variety of current and future climatic scenarios, accounting for and minimising any uncertainties;
- Working alongside project colleagues in Bergen to ensure the firn model outputs are robustly integrated into the glacier scale modelling experiments;
- Contributing to the broader aims of the research team through dialogue with colleagues, generation of ideas, advising on study design, problem solving, etc.;
- Contributing to knowledge exchange activities in Nepal, through giving lectures and/or seminars at appropriate academic institutions;
- Transforming and applying knowledge acquired from the Losing their Cool project by presenting research papers at conferences and scientific meetings.
- Contributing to and encouraging joint discussions with the wider research group and partners;
- Developing collaborations with colleagues at the University of Leeds and with external organisations/other Institutions to develop new external research links;
- Contributing to the development of further research funding applications;
- Generating and pursuing independent and original research ideas in the appropriate subject area;
- 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, 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 - i.e. the initial thesis needs to have been handed in at the point of application in Snow Studies, Glaciology, Geophysics or a closely allied discipline;
- Strong coding skills (e.g. Matlab or Python);
- Strong quantitative data analysis skills;
- The ability to communicate with scientific and non-scientific audiences, and to write high quality articles for publication;
- Initiative to explore new ideas and contribute to the development of the research, both conceptually and in practice;
- Good time management and planning skills, with the ability to meet tight deadlines, manage competing demands and work effectively under pressure without close support;
- 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.

Desirable
- Specific knowledge of, and experience applying, glacier energy balance or mass balance models;
- Experience of numerically modelling firn processes in high elevation settings;
- Knowledge of the scientific concepts underlying the project, in particular the major uncertainties in forecasting glacier change within the Himalayan region;
- Experience of collaborating with other researchers to ensure the integration of data designed to address a specific research question;
- Experience of simulating, or data modelling, cryospheric changes.

# 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.

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

Find out more about the [School of Geography](#)

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.

**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

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.

**Visa Information**

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