University of Reading

JOB DESCRIPTION

Vacancy reference:	SRF33529
Post Title:	Post-doctoral Research Scientist in the Dynamics of Arctic cyclones
Grade:	Grade 6
School/Department:	Department of Meteorology
Reports to:	Professor John Methven (line manager)
Responsible for:	None

Purpose

The post holder will carry out research into the dynamics of Arctic cyclones, including exploration of the mechanisms for development and the role of coupling with the underlying dynamic sea-ice distribution. The work will be part of the Arctic Summer-time Cyclones Project funded by the Natural Environment Research Council (NERC). The post holder will be based within the Department of Meteorology at the University of Reading.

Main duties and responsibilities

The overarching goal of the project is to determine the role of sea-ice surface properties in Arctic cyclone dynamics and to characterize the interaction of Arctic cyclones with the summer-time Arctic environment. We will focus on two important aspects of the Arctic environment where Arctic cyclones are hypothesized to be central: in their transport of sea ice during Very Rapid Ice Loss Events (VRILEs) and on the baroclinicity (temperature gradients) around the Arctic, influencing subsequent weather systems and forecasts of Arctic climate from weeks out to a season ahead. The objectives of the work packages associated with this post are:

- To identify sectors within Arctic cyclones where operational ensemble forecasts from different centres disagree, and where surface momentum fluxes deviate from observations;
- To determine the dynamical mechanisms responsible for Arctic cyclone development using the Met Office operational forecasting model (coupled and uncoupled) together with novel diagnostic tools unpicking the physical processes active and their dynamical interactions;
- To examine case studies from the observational campaign to identify deficiencies in simulations of the Arctic atmosphere and coupling with sea ice;
- To quantify the interactions between Arctic cyclones and the strength of the Arctic Frontal Zone in the summer climate and the influence of surface fluxes on these interactions.

The post holder will:

- Carry out research on the dynamics of Arctic summer-time cyclones using a combination of observational analysis, numerical modelling and development of theory.
- Participate in the field experiment led by the project team in summer 2021, centred on research aircraft flights from Svalbard flying over the Arctic sea ice edge.
- Organise operations, forecasting and research flight planning.
- Contribute towards delivery of several work packages of the NERC project.
- Collaborate in research with the project team and partners on the NERC project.
- Communicate research findings at project meetings, scientific conferences and with wider audiences as part of the outreach activity of the project.

- Write scientific articles on the research in the peer-reviewed literature and reports required for the NERC project.

Supervision received

Professor John Methven and Professor Suzanne Gray will supervise the scientific and organisational activities, via regular meetings. Professor John Methven will be your line manager. The postholder will be part of an experienced project team, including two NCAS (National Centre for Atmospheric Science) senior researchers with expertise in cyclone dynamics and members of CPOM (Centre for Polar Observations and Modelling), and be able to learn from the expertise of the other team members.

Supervision given

None, but the post holder will have the opportunity to co-supervise undergraduate students and MSc students for their dissertation projects.

Contact

The successful applicant will be based at the Department of Meteorology on the UoR Whiteknights campus. The post holder is expected to liaise and work closely with team members in the Arctic Summer-time Cyclones project based at the University of East Anglia, British Antarctic Survey, the Met Office and ECMWF. There will also be collaboration with an international scientific team linked to the project.

Terms and conditions

Full time fixed term (up to 2.5 years). The post holder will be resident in the UK for the entire period of this contract. There are no specified core hours of work, but you will be required to work such hours as are necessary to carry out the duties associated with the post. Overtime is not payable.

This document outlines the duties required for the time being of the post to indicate the level of responsibility. It is not a comprehensive or exhaustive list and the line manager may vary duties from time to time which do not change the general character of the job or the level of responsibility entailed.

Date assessed: 17 August 2020

PERSON SPECIFICATION

Job Title	School/Department
Post-doctoral Research Scientist in the Dynamics of Arctic cyclones	**Meteorology**

Criteria	Essential	Desirable
Skills Required	• Able to communicate effectively, both orally and in writing. • Able to manage own time effectively. • An ability to write and adapt complex computer programs in FORTRAN, Python, IDL or MATLAB. • Skills in processing and interpretation of data sets.	• Familiarity with UNIX/LINUX environment. • Using and experimenting with weather or climate models. • Specialist expertise with the Met Office Unified Model (MetUM).
Attainment	• Have (or expect shortly to obtain) a PhD in a physical or mathematical science. • A publication record appropriate to experience.	• A PhD in atmospheric science
Knowledge	• Atmospheric science (general) • Extratropical fluid dynamics • Thermodynamics	• Weather forecasting • Ensemble prediction • Cyclone dynamics theory • Arctic weather and climate • Boundary layers and surface exchange
Relevant Experience	• Using complex numerical models for investigation. • Experience in manipulating large data sets for scientific analysis. • Experience of presenting to expert and non-expert audiences.	• Experience running and adapting numerical weather prediction models. • Experience using diverse meteorological data sets. • Experience collaborating with remote partners. • Research project management experience.
Disposition	• Team working - able to interact constructively and proactively with collaborators. • Motivated to develop and progress work independently. • A willingness to participate in the field campaign (in Norway).	• Enthusiasm to communicate the research findings to broad audiences.

Completed by: John Methven	Date: 3 September 2020