

JOB DESCRIPTION

Vacancy reference:	SRF17668
Post Title:	Research Scientist In monsoon observations & modelling (INCOMPASS project)
Grade:	Grade 6
School/Department:	NCAS-Climate (Department of Meteorology)
Reports to:	Dr Andy Turner
Responsible for:	N/A

Purpose

INCOMPASS (*Interaction of Convective Organisation with Monsoon Precipitation, Atmosphere, Surface & Sea*) is a joint [NERC/MoES](#)-funded consortium project led by [Dr Andy Turner](#) at University of Reading and Prof. GS Bhat at [Indian Institute of Science](#). INCOMPASS brings together leading tropical meteorologists and modellers in the UK and India to combine ground-breaking aircraft observations and other observational data drawn from an extensive field campaign in 2016 with model experiments in order to better understand and predict the Indian monsoon.

The work will involve detailed analysis of the aircraft data in combination with outputs from satellite and ground instruments to explore the dynamic and thermodynamic structure of the atmosphere as the monsoon develops and the forcing exerted by land and ocean surfaces.

Main duties and responsibilities

The post-holder will perform in-depth analysis of aircraft and other observational data and use it to develop new understanding of monsoon processes on a variety of scales. The post-holder will use these data to interrogate high-resolution versions of the Met Office Unified Model (MetUM) run by University of Reading on High Performance Computing facilities. Further experiments will be developed to focus on particular case studies of the 2016 season.

The post-holder will also:

- Report on progress and results through appropriate methods, including papers for scientific journals and presentation of results at conferences/workshops;
- Maintain awareness of current progress in relevant research areas, to ensure that the research remains at the cutting edge;
- Collaborate with project partners elsewhere in the consortium, in the UK and India;
- Contribute to the maintenance of an active scientific environment through group meetings, departmental seminars etc.;
- Provide input to development of proposals for further research funding;
- Contribute to activities such as training, public engagement, knowledge exchange and policy advice, where appropriate.

Supervision received

The post holder will report to and receive guidance and direction as required from Dr Andy Turner (Principal Investigator of INCOMPASS), typically in face-to-face meetings on a weekly basis.

The post-holder will also be expected to work with Dr Arathy Menon, an existing PDRA for INCOMPASS at University of Reading, as well as participating in project meetings with the rest of the INCOMPASS consortium in the UK and India.

Supervision given

The post-holder has no formal supervision responsibilities however opportunities may become available for involvement in supervision of post-graduate research students.

Contact

The post-holder will be based in NCAS-Climate/Department of Meteorology at the University of Reading and will collaborate with partners at the Met Office and other institutes in the UK (University of Leeds and Centre for Ecology & Hydrology, Wallingford). International collaborations will also be expected with our partners in India.

Terms and conditions

Full time, fixed term for up to 24 months.

There are no specified 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.

The post-holder will be expected to present results of work at national and international conferences, as well as participate in project meetings as required.

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:

PERSON SPECIFICATION

Job Title	School/Department
Research Scientist: In monsoon observations & modelling (INCOMPASS project)	Department of Meteorology / NCAS-Climate

Criteria	Essential	Desirable
Skills Required	<ul style="list-style-type: none"> • Strong scientific analytic ability and high capacity for problem solving • Good oral and written communication skills • Ability to manipulate large or unusual datasets • Programming skills (e.g. knowledge of Python or other appropriate data processing and visualization language such as IDL or Fortran) 	
Attainment	<ul style="list-style-type: none"> • Have or shortly expect to attain a PhD in mathematical or physical sciences • Publication record appropriate to experience 	<ul style="list-style-type: none"> • Have or shortly expect to attain a PhD in climate, Earth System or atmospheric science
Knowledge	<ul style="list-style-type: none"> • Evidence of good understanding of physical processes relating to weather and climate 	<ul style="list-style-type: none"> • Tropical meteorology, including monsoon system dynamics
Relevant Experience	<ul style="list-style-type: none"> • Research in relevant atmospheric, oceanic or climate sciences • Processing and analysis of outputs from climate models 	<ul style="list-style-type: none"> • Processing and analysis of non-gridded data such as to be expected from in-situ instruments and field campaign data
Disposition	<ul style="list-style-type: none"> • Self-motivated, conscientious and creative • Ability to maintain productive collaborations 	

Completed by: Dr Andy Turner	Date: March 2017
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FURTHER PARTICULARS

The **INCOMPASS** project (Interaction of Convective Organisation and Monsoon Precipitation, Atmosphere, Surface and Sea) is one of three funded projects under the [NERC/MoES](#) Monsoons Programme. INCOMPASS is fully joint between UK and India, led by Principal Investigators [Dr Andy Turner](#) at University of Reading and Prof GS Bhat at the [Indian Institute of Science](#) in Bengaluru (Bangalore).

Monsoon systems are among the most pronounced features of the global climate, with regions under their influence undergoing dramatic seasonal variations in wind and precipitation. The Asian summer monsoon affects the lives of around one-third of the global population; India receives 80% of its annual rainfall during the monsoon summer of June to September. Thus the timing, intensity and duration of the monsoon are of immense importance to agriculture, developing industry in the region and public health. The monsoon undergoes variations on small to large spatial and temporal scales relating to local and remote phenomena. Yet our understanding of monsoon processes and some of their key drivers is ill understood. Many leading state-of-the-art general circulation models (GCMs) fail to simulate accurate representations of this complex variability and even the seasonal mean distribution and statistics of monsoon rainfall, limiting our confidence in forecasting and future climate prediction.

INCOMPASS focuses on detailed characterization of the monsoon in a unique field campaign that took place in spring/summer 2016, twinned with modelling work using the UK Met Office Unified Model (MetUM). As such, the Met Office is a major partner of INCOMPASS under Dr Gill Martin.

The 2016 INCOMPASS field campaign combined India's extensive existing observational network with an intensive period of enhanced radiosonde launches, surface flux measurements using newly installed flux towers, and the first deployment of NERC's [FAAM](#) Atmospheric Research Aircraft to South Asia. INCOMPASS used the modified BAe-146 jet during May-July 2016 in the first major measurement campaign using a foreign aircraft in India.

The aircraft was operated from twin bases:

- Lucknow in the northern plains of India (in the Ganges basin), primarily to measure contrasts in boundary layer and tropospheric structure and their interaction with the surface from the moist north-east region to the deserts of northwest India, and their evolution as the monsoon progresses;
- Bengaluru in southern peninsular India, primarily to measure the sharp gradients in rainfall and atmospheric structure from the Arabian Sea, across the coastline and Western Ghats mountains, through the rain shadow of southeast India and over the south Bay of Bengal.

A major focus of this post will be the analysis of in-situ and remote sensing data collected from the aircraft from the 2016 campaign, focusing on examining the role of dynamic and thermodynamic forcing on the monsoon along contrasts in space and time across India, including during progression of the monsoon onset as it happened.

The analysis will also comprise comparisons of the aircraft and other observed data with outputs from nested high-resolution models run in free-running and forecast mode, aiming to simulate case studies from the observing period at several resolutions up to the sub-kilometre scales.

Other UK partners include Prof DJ Parker and Dr J Marsham at University of Leeds, and Drs C Taylor and J Evans at CEH Wallingford. In India, partners include Drs EN Rajagopal and A Mitra from the National Centre for Medium Range Weather Forecasts, Dr B Bhattacharya at the India Space Research Organisation, as well as partners at Indian Institutes of Technology (IIT) in Bhubaneswar and Kanpur.

Work environment

The appointment is based in [NCAS-Climate](#) and the [Department of Meteorology](#) at University of Reading, although there will be opportunities to visit collaborators elsewhere in the UK and to participate in international meetings.

NCAS-Climate provides a core-strategic programme and national capability in modelling and understanding the climate system. It consists of over 40 scientists and includes an internationally recognised group focusing on the weather and climate of the tropics. The Department of Meteorology is a vibrant centre for atmospheric and ocean science with more than 20 teaching staff in addition to 50 research staff and 40 research students. In the most recent Research Excellence Framework results (REF 2014), 86% of our research was graded as world leading or internationally excellent. Our weighted score places us third in the country in the "Earth Systems & Environmental Science" category, and makes us the highest-graded department focusing on the fundamental science of weather and climate: we were rated particularly strongly on the new 'Impact' metric, and on 'research environment'. Similarly, our unique and comprehensive range of undergraduate and postgraduate courses has always received the highest grade.

The University of Reading aspires to be an 'Employer of Choice' and recognises that success is not simply determined by a competitive suite of terms and conditions of service, but by fostering a working environment that protects the physical and mental wellbeing of its staff. Full details of the University's Health and Well-being policy are available from through the [HR website](#). The University is committed to work-life balance and supportive of flexible working arrangements, and the School's website gives examples of excellent practices in respect of flexible work as well as for maternity/parental leave within the School. The University supports its staff in many other ways:

Its Centre for Quality Support and Development (<http://www.reading.ac.uk/internal/cstd/>)

Its excellent Nursery facilities (<http://www.rusu.co.uk/intheunion/nursery/>)

Its SportsPark (<http://www.sport.reading.ac.uk/>)

Its membership of Childcare+ (<http://www.reading.ac.uk/internal/humanresources/>)



The School of Mathematical and Physical Sciences was awarded an Athena SWAN Silver award in 2010, renewed in 2014, in recognition of its good employment practices in relation to women working in science, engineering and technology (SET). Please follow the [link](#) for more information.



The University is a [Stonewall Diversity Champion](#) and is participating in Stonewall's 2015 Workplace Equality Index.