

FURTHER DETAILS – SRF29805

Research Scientist in understanding Indian monsoon teleconnections for coupled seasonal prediction

This document gives additional information for the open position under the WCSSP India programme in the STIMULATE project at University of Reading, to commence 1 September 2019 or as close as possible thereafter.

Background

This post is part of the STIMULATE (Seasonal Teleconnections to the Indian Monsoon: Understanding the Large-scale Atmospheric Tropical Environment) project funded by the Newton Fund/Met Office [WCSSP \(Weather and Climate Science for Service Partnership\) India](#) programme. STIMULATE is led by Principal Investigator [Dr Andy Turner](#) at the National Centre for Atmospheric Science ([NCAS](#)) at the Department of Meteorology of the University of Reading, with Co-Investigators [Dr Nick Klingaman](#) and [Dr Kevin Hodges](#).

The consortium

STIMULATE is a ~£1 million consortium. Joining University of Reading are the University of East Anglia School of Environmental Sciences ([Dr Ben Webber](#), [Prof. Manoj Joshi](#)), the University of Edinburgh School of Geosciences ([Dr Massimo Bollasina](#)) and the University of Leeds School of Earth and Environment ([Dr Jennifer Fletcher](#), [Dr John Marsham](#)). STIMULATE will also form collaborations with Indian partners following consultation with the Met Office, such as the [Indian Institute of Tropical Meteorology](#) and the [National Centre for Medium Range Weather Forecasting](#).

Motivation

India receives 80% of its rainfall between the months of June and September, providing the majority of the water supply for agriculture, industry and human health. Indian society is very sensitive to any variations in the timing, intensity and duration of the monsoon, making seasonal and subseasonal forecasts of vital importance. However, the coupled general circulation models (GCMs) used to forecast the monsoon suffer from large biases in the mean monsoon rainfall and circulation, in the drivers of seasonal variability such as the El Niño-Southern Oscillation (ENSO) or the Indian Ocean Dipole (IOD), and in the teleconnection pathways that connect these predictive drivers with the monsoon. Work is therefore urgently needed to better understand the mechanisms for seasonal teleconnections of the Indian monsoon, evaluate the simulations of these mechanisms in the latest GCMs, and to offer suggestions for solutions to ameliorate errors.

The work

In STIMULATE, we will use a variety of different approaches to address these critical problems for monsoon prediction. Atmosphere and ocean biases will be assessed in the latest versions of the Met Office Unified Model (MetUM), including the coupled seasonal prediction framework GloSea5 and the HadGEM3 and UKESM1 contributing models to CMIP6. These models will be assessed against the latest observational data, including from recent field campaigns of the atmosphere and ocean, and long-term reanalysis products; model evaluation may also be performed against other models in the CMIP6 multi-model database. A variety of novel methods will be used to diagnose the teleconnection pathways between drivers such as ENSO, the IOD, or from the Atlantic Ocean and monsoon rainfall and circulation. These mechanisms will also be assessed in a hierarchy of models, including simplified/intermediate GCM frameworks. How teleconnections – and therefore the seasonal predictability of the monsoon – vary on decadal time scales will also be assessed in reanalysis data and models. Finally, we will use a scale-interactions approach to examine the final local response of monsoon convection to large-scale forcing, helping to diagnose whether the local scale is responsible for errors in monsoon prediction.

STIMULATE will be delivered across four areas of activity, organised around the following work:

1. Observed teleconnections to the Indian summer monsoon and coupled mechanisms supporting those teleconnections;
2. Origins and impacts of model biases in coupled seasonal monsoon prediction;
3. Scale interactions and their impact on monsoon prediction at different scales;
4. Collaboration with partners at the Met Office and in India.

While the position at University of Reading will primarily be concerned with and lead the first activity, we expect that the scientists in STIMULATE will work together among the consortium on several collaborative papers.

THE WORKING ENVIRONMENT

The National Centre of Atmospheric Science (NCAS) comprises approximately 70 scientists at Reading and provides a core-strategic programme and national capability in modelling and understanding the climate system. The Department of Meteorology at Reading is the largest of its kind in Europe with over 200 academics and research scientists, around 80 PhD students, and around 90 taught undergraduate and postgraduate students. In the most recent Research Excellence Framework results (REF 2014), 86% of our research was graded as world leading or internationally excellent. Ranking fourth in the country in the “Earth Systems & Environmental Science” category, with 100% of research impact classed as world leading or internationally excellent, this makes us the highest-graded department focusing on the fundamental science of weather and climate.

The University 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 well-being of its staff. Full details of the University's Health and Well-being policy are available 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](#);

STIMULATE project further details – Andy Turner

- Its excellent [Nursery facilities](#);
- Its [SportsPark](#);
- Its membership of [Childcare+](#).

The University and the School of Mathematical, Physical and Computational Sciences (SMPCS) – comprising the Departments of Mathematics and Statistics, Meteorology, and Computer Science – aims to create a supportive and inclusive working environment for the benefit of all its staff and students (see [SMPCS WIDE](#)). The School of Mathematical and Physical Sciences (as it was then) was awarded an Athena SWAN Silver award in 2010, renewed in 2014 and again in November 2017, in recognition of its good employment practices in relation to women working in science, engineering and technology (SET). In January 2019 the University achieved its highest-ever ranking in the Stonewall Workplace Equality Index (WEI), moving into the Stonewall Top 100 Employers for the first time! We placed 80th out of the 445 employers that applied for this scheme.

