Further particulars: Research scientists in the ERC *Couplet* Project-SRF32762

The magnitude and impacts of many aspects of projected climate change due to anthropogenic emissions of greenhouse gases are expected to be greater for larger global mean surface temperature change. Although climate models have hugely improved, knowledge has grown and confidence increased, the climate feedback parameter, which determines the amount of global warming that results at equilibrium for a given radiative forcing (the heating due to greenhouse gases and other agents) is still very uncertain; for example, the range of equilibrium warming for a CO_2 concentration of twice the pre-industrial level is 1.5–4.5 K, the same as estimated 25 years ago. It is widely assumed that we can evaluate the climate feedback parameter from the observed past or from an idealised model experiment with increased CO_2, then use it to estimate global warming for future scenarios. However, research has revealed that, as well as being uncertain, the climate feedback parameter is not constant; it depends on the nature and magnitude of the forcing agent, it changes over time under constant forcing, it does not apply equally to spontaneous unforced climate variability, and it is not the same in the historical record and projections.

The hypothesis of this project is that the inconstancy of the climate feedback parameter reflects inadequacies of the global energy balance framework, which relates radiative forcing, climate feedback and ocean heat uptake to transient climate change, treating them all simply as global quantities. Actually they are all phenomena with variable geographical patterns influenced by coupled interactions. The atmosphere cannot predict the patterns of change in surface conditions, which strongly affect the climate feedback parameter, nor the ocean the patterns of change in surface fluxes, which strongly affect the ocean heat uptake efficiency. The objectives of *Couplet* are therefore to develop a new framework for describing the variations of the coupled atmosphere–ocean climate system, by taking into account the relationships between the geographical patterns of change and its time-development in analyses of simulated and observed climate change, and to apply this framework to the analysis of historical climate change, in order to set refined constraints on the processes, pattern and magnitude of future CO_2-forced climate change.

The post is funded by an Advanced Grant to the PI from the European Research Council. As well as present post, two other postdoctoral research scientists and the PI, the project team also has a computational scientist to help develop analysis software. The post is based at the Department of Meteorology at the University of Reading, within the programme on long-term global change of the National Centre for Atmospheric Science (NCAS). NCAS is a distributed institute of NERC comprising groups at several universities, with more than 50 scientists at Reading, contributing to a core-strategic programme and national capability in modelling and understanding the climate system. The Department of Meteorology is a thriving centre for atmospheric and ocean science with more than 200 research and academic staff and 40 research students. In the most recent UK Research Assessment Exercises 86% of the research of the Department was graded as world-class or internationally excellent.

WELLBEING, EQUALITY AND DIVERSITY

The School of Mathematics, Physics & Computational Science strives to cultivate an open, interactive and friendly working environment. We are delighted to have been recognised with an Athena SWAN Silver award for our commitment to proactive gender-neutral employment practice, and ensure we have strong support for those with disabilities and flexible working arrangements throughout our departments.

The University is a Stonewall Global Diversity Champion