

JOB DESCRIPTION

Vacancy reference:	SRF15063
Post Title:	Postdoctoral researchers (4 Posts)
Grade:	Grade 6
School/Department:	SMPSC/Meteorology
Reports to:	Prof Peter Jan van Leeuwen
Responsible for:	N/A

Purpose

The 4 postdocs are to do fundamental research in causality and nonlinear data assimilation as part of the ERC Advanced Investigator project CUNDA.

Main duties and responsibilities

These 4 posts form the core group of scientists in the CUNDA project, together with PI Van Leeuwen. CUNDA (Causal relations Using Nonlinear Data Assimilation) is a 2.6M€ Advanced Investigator project funded by the European Research Council ERC. The team will investigate and develop new methods to infer cause-and-effect (causality) relations, first in low-dimensional systems but pushing to high-dimensional highly nonlinear geophysical systems, in a quantitative Bayesian framework. At the same time efficient fully nonlinear data-assimilation methods for such high dimensional systems need to be developed. These two strands come together by applying the causality inference to a state-of-the-art ocean model in which 25 years of satellite and in-situ observations have been assimilated. The ocean area of interest is the ocean around South Africa, where the Indian, Atlantic, and Southern Ocean meet in a highly turbulent way. We will address some of the major questions in oceanography on the coupling between the wind-driven and thermohaline circulation, and explore causality to understand the highly nonlinear interactions in this area. The projects needs highly motivated excellent researchers with expertise in one or more of the diverse areas of causality, nonlinear data assimilation, physical oceanography and numerical modelling. A part-time programmer will also be part of the project.

The postdocs will

- Perform original fundamental research on causality and/or nonlinear data assimilation in high-dimensional geophysical systems
- Publish their high-quality research in leading journals in the field
- Be an active member of the research team and the Data Assimilation Research Centre (DARC), and the international community to help push science to the highest level.

Supervision received

The postdocs will have weekly meetings with prof Van Leeuwen.

Supervision given

The postdocs are encouraged to participate in supervision of MSc and PhD students.

Contact

The postdocs will attend the weekly DARC seminars and weekly CUNDA research group meetings. There is strong interest in the Meteorology and Maths and Stats Departments for the work, so several spin-off research projects are expected to be initiated, in which the postdocs can take part. Van Leeuwen is Director of the Data Assimilation Division of the National Centre for Earth Observation, and the postdocs are expected to join that Centre as affiliated members and be actively involved in scientific activities of the Centre.

Terms and conditions

The positions are full-time fixed term

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:

25 November 2016

PERSON SPECIFICATION

Job Title	School/Department
Postdoctoral Research Assistant	Meteorology

Criteria	Essential	Desirable
Skills Required	At least one of the following <ul style="list-style-type: none"> • Fortran90 • C • Python • UNIX • MPI 	<ul style="list-style-type: none"> • Fortran90 • C • Python • UNIX • MPI
Attainment	<ul style="list-style-type: none"> • PhD in quantitative science or maths 	<ul style="list-style-type: none"> •
Knowledge	At least one of the following: <ul style="list-style-type: none"> • Data assimilation • Causality quantification • Physical oceanography • High-dimensional geophysical modelling 	<ul style="list-style-type: none"> • Nonlinear data assimilation in high-dimensional systems • Causality quantification • Physical oceanography • High-dimensional geophysical modelling
Relevant Experience	<ul style="list-style-type: none"> • Strong publication record in relation to experience and areas relevant to this post 	
Disposition	<ul style="list-style-type: none"> • Team worker • Highly motivated • Ability to work independently • Creative 	

Completed by: Prof Peter Jan van Leeuwen	Date: 25/11/22016
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