

PhD Studentship: Critical Transitions in the Earth System - University of Reading
MCA-ITN CriticalEarth - Deadline: May 1st 2021

PhD Studentship in Mathematics

Supervisors: Professor Valerio Lucarini, Dr Jeroen Wouters, Dr Tobias Kuna

Project Overview:

Multi-stability is a ubiquitous property of geophysical systems: for a given choice of values of the internal and external parameters, two or more asymptotic states can be realised. In the case of deterministic dynamics, the phase space is partitioned between the basins of attraction of such asymptotic states, which live on – possibly strange – attractors. In the case noise is added into the systems, transitions between the various basins of attractions are possible, and, typically, over very long time scales the neighbourhood of all asymptotic states is explored, up to convergence to the invariant measure of the system. In the weak noise limit, transitions occur through special regions of the basin boundaries, called edge or Melancholia states. We will explore the theory of noise-induced transitions in complex systems of geophysical interest and use response theory to flag the vicinity of the tipping points. Taking advantage of recent advances in the theory of stochastic resonance for non-equilibrium systems, we will investigate the possibility of resonant behaviour in the response for suitable tuning of periodic forcing and intensity of the acting noise.

This position is part of the CriticalEarth project – a Horizon 2020 Marie Skłodowska-Curie Actions, Innovative Training Network (ITN) & the successful candidate will form a network of 15 PhD students across different universities in Europe. The candidate will have secondments at the University of Oldenburg (Germany) and the Politecnico di Torino (Italy).

Eligibility:

- Fully funded position open to World-wide candidates. Mobility and family allowance provided to help with relocation and family costs (if applicable) & Visa/Permit Support.
- Qualification requirement of a 2:1 Bachelor Degree or equivalent in Applied Mathematics, Climatology & Climate Change, Theoretical Physics.
- Applicants must not have resided or carried out their main activity (work, studies, etc.) in the UK for more than 12 months in the last 3 years - unless as part of a procedure for obtaining refugee status under the Geneva Convention.
- The candidate must be in the first 4 years (full-time equivalent research experience) of their research career and not awarded a doctoral degree.
- For further information visit the website (<https://www.criticalearth.eu/>) or contact Professor Valerio Lucarini (v.lucarini@reading.ac.uk)
- Web link: <https://research.reading.ac.uk/cmpe/>

Funding Details:

- Starts 1st July 2021
- 3 year award
- Salary range £27,511 - £34,804 per annum subject to knowledge, skills and experience.

- A Marie Curie allowance of up to £2,940 per annum and a Mobility allowance of £5,075 per annum in line with the Marie Curie Horizon 2020 requirement for Early Stage Researchers.

How to apply:

To apply for this studentship please submit an application for a PhD in Mathematics at

<http://www.reading.ac.uk/graduateschool/prospectivestudents/gs-how-to-apply.aspx>

Application Deadline: 1st May 2021

See also:

<https://www.jobs.ac.uk/job/CEQ293/phd-studentship-multiscales-and-critical-transitions-in-the-earth-system>