UNIVERSIDAD DE VALLADOLID: CALL FOR PHD POSITION IN MATHEMATICS/MATHEMATICAL SCIENCES
MSCA-ITN-643073-CRITICS

Critical Transition and Complexity in Monotones Skew-product Semiflows
within the framework of the European-wide Marie Curie Innovative Training Network “Critical Transitions in Complex Systems” (CRITICS) is available at the Mathematical Institute of the University of Valladolid (Spain), starting earliest in September 2015.

1. Identification of job position being offered and contractual relationship

Number of job positions being offered: 1
Professional category/group: PHD position in Mathematics /Applied Mathematics
Critical Transition and Complexity in Monotones Skew-product Semiflows
Estimated duration of contract: 3 years
Associated project: CRITICS
Estimated remuneration: 32.000,00 euros/year.

Remuneration, legal and administrative matters, and the eligibility of the candidates, are determined by the specific regulation of Marie-Sklodowska Curie Actions, Horizon 2020, and the Spanish Labour Legislation.

2. Relevant Information

Project: The PhD project combines arguments of applied mathematics, dynamical systems and mathematical modelization. The aim is the study of the long term behavior of the trajectories of continuous and discrete almost-periodic skew-product semiflows, and the application of its conclusions in the analysis of mathematical models of applied sciences and engineering. The case of monotone skew-product semiflows will be intensively investigated. The project will analyze low dimensional ordinary differential equations, discrete and continuous Hamiltonian systems and the extension of some of the finite dimensional results to nonautonomous reaction-diffusion and delayed differential equations. A relevant question will be the presence...
of invariant compact pinched sets and almost-periodic or almost-automorphic minimal
sets. The connections between these sets in the local or global attractors will play an
important role in the analysis of dissipative systems. An objective will be the study of
the variation of critical parameters that determine the transition from the order that
provides the uniform stability to different scenarios of high complexity or chaotic
dynamics.

**Research environment:** The University of Valladolid is one of the oldest Spanish
universities with a long tradition in the learning and research of scientific and
 technological problems. The successful candidate will be member of the Mathematical
Institute of Mathematics (IMUVA), that organizes important activities during each
academic year and provide a stimulating research environment. It will be a member of
the research group “Sistemas Dinámicos” and will participate in the activities of the
national network DANCE, that includes most of the Spanish research groups on
Dynamical Systems and their applications.

**Training Network:** An important aspect of the project will be the interdisciplinary
interaction with scientists from the partner institutions in the Training Network,
including Imperial College of London (Martin Rasmussen, Jeroen Lamb), University of
Exeter (Peter Ashwin), Wageningen University (Marten Scheffer), Utrecht University
(Hendrik A. Dijkstra), University of Copenhagen (Peter Ditlevsen), Jena University
(Tobias Oertel-Jäger), Technical University Dresden (Kathrin Padberg) and
Foundation CIDAUT (Alonso Hornillo). He will have the opportunity to participate in all
the training activities of the network and to undertake extended visits to some of the
partner institutions.

**Living:** Valladolid is a prospering medium-size city in the center of Spain that is well
connected with Madrid and Barcelona. It has a large student population and offers
many cultural and recreational activities and a high standard of living.

**Qualifications:** We are looking for a candidate with strong mathematical skills and
ability to take an interdisciplinary perspective and work with scientists from other
related fields. A background in Differential Equations, Dynamical Systems and
programming skills with mathematical software (MATLAB, Python, etc) are
advantageous, fluency in English is expected. Candidates should hold a master degree
(or equivalent) in Mathematics, Applied Mathematics, Modelization in Applied
Sciences or related areas.

### 3. Requirements and merits

Requirements: candidate with strong mathematical skills and ability to take an
interdisciplinary perspective and work with scientists from other related fields. A
background in Differential Equations, Dynamical Systems and programming skills with
mathematical software (MATLAB, Python, etc) are advantageous, fluency in English is
expected. Candidates should hold a master degree (or equivalent) in Mathematics,
Applied Mathematics, Modelization in Applied Sciences or related areas.
4. Application, deadline and submission

Copies of all relevant degrees as evidence of both compliance with requirements and merits. Candidates may be asked to submit the original documents during the selection process. Failure to submit these documents may lead to disqualification.

Application deadline: 15th June 2015, Monday, 17:00h

Applications must be sent to: Applications should include a CV, a short letter of motivation, the master thesis and/or any other scientific manuscript authored by the candidate (paper, preprint, etc), and should be sent electronically until 15 June 2015 to Prof. Rafael Obaya (E-mail: rafoba@wmatem.eis.uva.es)

5. Stages of the selection process

They will be regulated by FUNGE Fundación General de la Universidad de Valladolid. (E-mail: opeuva@funge.uva.es)

6. Communication with candidates

All communications will be sent to candidates by email and published in the Department’s bulletin board.