



# MARIE Skłodowska-CURIE INNOVATIVE TRAINING NETWORK

## OPEN CALL – PhD position



### Host (recruiting) organisation

Universitat Politecnica de Catalunya · BarcelonaTech, Barcelona, Spain

**Project Title:** Validation and reliability for thermo-mechanical simulations

### Supervisory team

<b>Primary academic institution</b> Prof. Pedro Díez Universitat Politecnica de Catalunya · BarcelonaTech	<b>Industrial institution</b> Dr. Jean-Louis Duval ESI Group
<b>Secondary academic institution</b> Prof. Francisco Chinesta and Prof. Elías Cueto École Centrale de Nantes	

### Project description

This project pertains to the verification and validation (V&V) techniques applied to the simulation of problems of high industrial relevance (additive manufacturing) to be solved with state-of-the-art numerical methodologies (reduced order models).

V&V is an essential approach to modern computational mechanics for industrial problems, aiming at certifying that 1) the model corresponds to the physical reality (Validation) and 2) the numerical solution is accurate enough to meet the requirement of the end user (Verification).

Fast, reliable and robust simulations are a major goal for industrial competitiveness. Once feasible computations for the desired problem are available, verification and validation (V&V) techniques assess reliability of both model & numerical approximation. However, both input data and measurements used for validation are most times subject to uncertainties that have to be also accounted for in the model. The reduced order solutions in multiparametric setups allow resolving a large number of stochastic dimensions describing uncertainty. The aim of this project is to develop a methodology able to joint the expertise of the academic partners on V&V and parameterized reduced order models. The longstanding and solid experience of the industrial partner guarantees relevant contributions where uncertainty is at the heart of the simulation. The parameterized generalized solutions (*computational*



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*vademecums*) obtained with the corresponding accuracy for both models and methods allow efficiently applying uncertainty quantification techniques.



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## Benefits

- Doctorate degree from both UPC·BarcelonaTech and École Centrale de Nantes
- Integration within the research group of an industrial leader in software production.
- 36 month full-time employment contract
- Additional mobility and family allowances
- Research supervision and training by recognised experts in computational mechanics from academia and industry
- Access to state-of-the-art research and computing facilities
- Training in transversal skills (e.g. communication skills, entrepreneurship)

## Prerequisites

- To have a strong undergraduate and MSc degree (or equivalent) in Engineering, Mathematics, Physics or a related field and a good level of English
- To have an enthusiastic attitude to conduct research, being hard-worker and critic
- To demonstrate knowledge of some programming languages such as Matlab and Fortran
- To have some experience with Finite Element analysis

## Eligibility

Applicants shall, at the time of recruitment by the Universitat Politècnica de Catalunya · BarcelonaTech, be in the first four years (full-time equivalent research experience) of their research careers and have not been awarded a doctoral degree. Full-Time Equivalent Research Experience is measured from the date when a researcher obtained the degree, which would formally entitle him/her to embark on a doctorate, irrespective of whether or not a doctorate is or was ever envisaged.

At the time of recruitment by the host organisation, researchers must not have resided or carried out their main activity (work, studies, etc.) in SPAIN for more than 12 months in the 3 years immediately prior to the reference date.

## Duration of the project

The total duration of the project is 36 months.

## Obligations of ESRs

- Completion of the Erasmus Mundus Joint PhD programme Simulation Engineering and Entrepreneurship Development (SEED)
- Be highly committed with quality research, training and management. The successful candidate is expected to become a future leader on the development and application of advanced computational methods for industry
- Take part of the mobility programme both in academia and industry
- Participate on the dissemination and outreach activities associated to the project
- Attend international conferences and present the research undertaken
- Contribute to the writing of articles in high impact international journals

## Closing date

March 31, 2016

## How to apply

[www.lacan.upc.edu/AdMoRe](http://www.lacan.upc.edu/AdMoRe)

## Questions

[admore.itn@upc.edu](mailto:admore.itn@upc.edu)