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## CALL FOR ITMATI RESEARCHER RECRUITMENT

### OPEN EARLY STAGE RESEARCHER/PHD POSITION

**PROJECT:** European Innovative Training Network *Reduced Order Modelling, Simulation and Optimization of Coupled systems* (ROMSOC).

**TYPE OF PROJECT:** The [ROMSOC](#) project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie-Sklodowska-Curie grant agreement No 765374.

**OBJECTIVES OF PROJECT:** ROMSOC is a European Industrial Doctorate (EID) project in the programme Innovative Training Networks (ITN) and part of Marie Skłodowska Curie Actions within the Horizon 2020 programme.

The ROMSOC EID Network brings together 15 international academic institutions and 11 industry partners and supports the recruitment of eleven Early Stage Researchers (ESRs). Each ESR will be working on an individual research project in the host institution with secondments related to their research in other academic and industrial partners of the network. The research is focused on three major topics: coupling methods, model reduction methods, and optimization methods, for industrial applications in well selected areas, such as optical and electronic systems, economic processes, and materials. The ROMSOC EID Network offers a unique research environment, where leading academics and innovative industries will integrate ESRs into their research teams for the training period, providing an excellent structured training programme in modelling, simulation and optimization of whole products and processes.

**JOB OFFER REFERENCE:** ITMATI-OT-04/2018/ROMSOC-ESR08.

**CALL:** Open Early Stage Researcher/PhD Position at Consorcio Instituto Tecnológico de Matemática Industrial (ITMATI), Santiago de Compostela, Spain.

**DESCRIPTION OF JOB POSITION:** 1 full-time contract for 36 months as PhD position for the ROMSOC project, ESR-08. The PhD degree will be awarded by University of Santiago de Compostela, Spain.

**WORKING TITLE:** *Efficient Computational strategies for complex coupled flow, thermal and structural phenomena in parametrized settings.*

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**WORKING OBJECTIVES:** Present and future efforts in simulation-based sciences are dedicated to hierarchies of complex multi-physics problems, as well as parameterized systems characterized by multiple spatial and temporal scales. New ROM methodologies are required for coupled and parameterized problems in industrial and medical sciences. This concerns in particular fluid-structure interactions and thermo-fluid-dynamics and the use of these reduced models for Fluid-thermal phenomena.

Objectives:

- (i) The numerical simulation of the evolution of the fluid will be carried out using a turbulence and multi-phase model. A transport passive scalar phenomenon will also be modelled in the problem.
- (ii) Modelling and simulation of 3D thermal-fluid-structure phenomena.
- (iii) Numerical simulation will be performed on free or commercial software packages of proven quality.
- (iv) Reduced order modelling (computational, geometrical and parametric) for hierarchies of coupled multi-physics problems.
- (v) Construction of test cases and carrying out numerical experiments.

Expected Results:

- (i) New model reduction methods for coupled systems of fluid-structure interactions and thermo-fluid-dynamics.
- (ii) Error estimators for such coupled systems.
- (iii) Computational model reduction software.

**PRINCIPAL INVESTIGATOR:** Dr Peregrina Quintela Estévez (Primary Supervisor), Professor of Applied Mathematics of the University of Santiago de Compostela and affiliated researcher of ITMATI.

**CANDIDATES PROFILE:** Master degree (or equivalent) in Mathematics, Mathematical, Aeronautical, Mechanical, Civil, Nuclear Engineering, Scientific Computing or other related disciplines. We seek excellent open-minded and team-spirited PhD candidates who will get unique international, interdisciplinary and inter-sectoral training in scientific and transferable skills by distinguished leaders from academia and industry.

**ELIGIBILITY:** The candidate recruited in the ROMSOC project must be in the first four years from the date when the candidate obtained the degree entitling him or her to embark on a doctorate (e.g. master degree). No doctoral degree has been awarded during these four years. The candidate must not have resided or carried out her/his main activity (work, studies, etc.) in the host country for more than 12 months in the 3 years immediately prior to the recruitment date. Compulsory

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national service, short stays such as holidays, and time spent as part of a procedure for obtaining refugee status under the Geneva Convention are not taken into account. The candidate must work exclusively for the project during the employment contract. The candidate must fulfil the conditions to be admitted in the PhD programme indicated in the job vacancy. Tuition fees will be covered by the fellowship. These conditions must be fulfilled at the starting date of the contract. The starting date for each position is tentative. More details can be found in the [Guide for Applicants to the H2020 Programme Marie Skłodowska-Curie Actions - Innovative Training Networks \(ITN\)](#).

#### REQUIREMENTS:

- Experience in numerical solution of differential equations, tensor analysis, and model order reduction.
- Programming skills in object oriented languages as well as Python/Matlab.
- Strong interest in interdisciplinary scientific work.
- Ability to work independently and as part of a team.
- Strong motivation to pursue a PhD degree.
- Preferred qualifications include excellent grades, research talent (as proven by the master thesis), affinity with mathematical modelling and simulation in engineering applications, and personal ambition.
- Excellent command of English, together with good academic writing and presentation skills.

#### MERITS AND REQUIREMENTS TO BE ASSESSED:

- Training according candidates profile and requirements: *40 points, all contributions must be documented.*
- Knowledge and specific experience according requirements: *35 points, all contributions must be documented.*
- Personal interview: *25 points.* Candidates achieving the best assessments according to the above criteria will be called to a personal interview in which letters of recommendation to their application will be considered. At least the three most highly valued candidates will be interviewed.

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**CONDITIONS:** A contract will be carried out for the specific project or service.

- The Marie Skłodowska-Curie programme offers highly competitive and attractive salaries. Gross and net amounts are subject to country specific deductions as well as individual factors and will be confirmed upon appointment.
- Gross monthly salary: the gross monthly salary result from deducting all compulsory employer social security contributions will be 2,241.20 € in 12 payments, in accordance with current Spanish legislation. This amount will be increased with the corresponding mobility allowance, and the family allowance depending of the family status of the researcher recruited.
- Starting date: 1st of April 2018, subject to the granting of funds to carry out the project.
- End date: March 31<sup>th</sup>, 2021, whenever the project availability allows.
- Full time position.

**WORKPLACE:** Technological Institute for Industrial Mathematics (ITMATI), Campus Vida of the Universidade de Santiago de Compostela, Santiago de Compostela (Spain). The PhD candidate will spend secondments for technical and scientific training at Danieli Officine Meccaniche SPA (Italy) and SISSA, International School for Advanced Studies, Trieste (Italy).

#### **SUBMISSION OF APPLICATIONS:**

People interested in this contract must send their applications by March 18, 2018. Application should include a motivation letter, a cover letter summarizing the applicant's career (general training and experience to be assessed, as well as additional merits referred to in the call), a detailed CV (with mobile phone and email), certificates, list of MSc courses and grades, copy of the master thesis, letters of recommendation to their application, etc. Applicants, that apply for more than one individual research project of the European Innovative Training Network ROMSOC, should indicate the order of preference (e.g. 1st, 2nd and 3rd choice).

To ensure the equality of opportunities we strongly encourage women with the appropriate qualifications to apply. If equally qualified, handicapped applicants will be preferred. All documentation must be sent to the following email address [itmati@itmati.com](mailto:itmati@itmati.com), indicating the job offer reference ITMATI-OT-04/2018/ROMSOC-ESR08 in the "subject" of the email. The receipt of requests will be confirmed by email.

**EVALUATION COMMITTEE:** Submitted applications will be evaluated by an Evaluation Committee appointed for the purpose of this call. The Evaluation Committee will be published at the end of the evaluation period jointly with the call resolution.

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**DEADLINES AND RESOLUTION:**

Reception of applications: until March 18, 2018.

Evaluation of applications and personal interviews: from 19<sup>st</sup> to 28<sup>nd</sup> March 2018.

Resolution of the call: March 2018.

**WAITING LIST:**

After the resolution of this call, candidates who have not been selected but meet the requirements laid down therein will automatically become part of a "waiting list" for this call in order of merit, according to the requirements established in the call. This "waiting list" will be published the same day as the resolution of the call, and will remain in force during the full project lifetime. If it deems it appropriate, the Evaluation Committee of this call may make use of the "waiting list" provided that any researcher leaves the project voluntarily, and for the entire project duration.

All information on this call, as well as its resolution, will be published on the ITMATI website:  
<http://www.itmati.com/>.



Salida:

19 / 02 / 2018

Nº Registro:

48

Peregrina Quintela Estévez  
Director of ITMATI

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## Sinatura dixital / Firma digital / Digital signature

Asinante/Firmante/Signer: PEREGRINA QUINTELA ESTEVEZ, NIF 36038289A, 19/02/2018 10:53:28.

CSV: 4C86-0516-4901-B27A