



MARIE Skłodowska-CURIE INNOVATIVE TRAINING NETWORK

OPEN CALL – PhD position



UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH

Host (recruiting) organisation

Technische Universität München, Germany

Project Title: Solid-fluid mixture models for high particulate volume fractions

Supervisory team

Primary academic institution W. A. Wall, M. Kronbichler Technische Universität München	Industrial institution A. Kidess Hilti
Secondary academic institution S. Zlotnik, P. Diez, A. Huerta Universitat Politècnica de Catalunya	

Project description

In applications like sanding, drilling, grinding (concrete or wood dust in air), coring (concrete in water) and industrial vacuums, solid particles are transported with a fluid. The motivation of this project is to develop a computational model that allows to investigate the particle transport in order to improve tool performance and life on the one hand, and to comply with ever-tighter government regulations on dust emissions on work sites on the other hand. Some of the challenging aspects that make current approaches fail, are the high particle load, the need to predict accretion/deposition, particle interaction with the walls, etc. In this project we will tackle this problem via a highly efficient coupled particle-fluid method. Based on this model and respective insight, extensions for a mixture-model will be derived that should allow simulation of such problems at a much better quality than currently available mixture-model approaches and at much lower costs as fully resolved simulations, in the future.

Benefits

- Research supervision and training by recognised international experts in computational mechanics
- Integration within R&D activities of an industry leader



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- Doctorate degree from both TUM and UPC
- 36 month full-time employment contract
- Additional mobility and family allowances
- 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, (Applied) Mathematics, Physics or a related field and a good level of English
- To have an enthusiastic attitude to conduct research, being hard-working and critical
- To have a strong background in (fluid and/or solid) mechanics, numerical methods, etc.
- To demonstrate knowledge of a programming language such as C++, Fortran, etc.

Eligibility

Applicants shall, at the time of recruitment by TUM, 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 Germany 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 (Early Stage Researchers)

- Completion of the PhD programme
- Be highly committed with high 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 in the mobility programme both in academia and industry
- Participate in 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

Until position is filled

How to apply

<http://www.lacan.upc.edu/ProTechTion>

Questions

protection.itn@upc.edu