Early Stage Researcher / PhD Position at the Institut de Mécanique des Fluides de Toulouse, INPT, France, as part of

European Innovative Training Network

**Smart Tomographic Sensors for Advanced Industrial Process Control (TOMOCON)**

The European Marie Skłodowska-Curie Innovative Training Network TOMOCON joins 12 international academic institutions and 15 industry partners. We work together in the emerging field of industrial process control using smart tomographic sensors. The network will lay the scientific and technological fundamentals of integrating imaging sensors into industrial processes and will demonstrate its functional feasibility on lab and pilot-scale applications. Our doctoral researchers will be trained and work in the fields of process tomography hardware, software and algorithms, control systems theory and design, industrial process design, multi-physics modelling and simulation, human-computer interaction, and massive parallel data processing. More information about the network and all open positions can be found on our web page [www.tomocon.eu](http://www.tomocon.eu).

Within TOMOCON 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. Within the TOMOCON network we offer the following PhD position at IMFT/INPT:

**Hybrid CFD simulation of two-phase flow in inline flow splitters using VOF and Lagrangian models**

Reference number: TOMOCON-ESR6

Inline fluid separation is an efficient way to split fluid mixtures via density-based centrifugal separation in a pipe. The PhD candidate shall develop two-phase CFD simulations of centrifugal separation where transitions from dispersed flow to separated swirling flow have to be properly described by CFD. Since full DNS simulations (using VoF or LevelSet) are not adapted for this class of problems, the PhD candidate will develop adapted numerical methods. A new hybrid approach coupling VoF/LevelSet and Lagrangian tracking of "sub-grid" bubbles will be developed and tested against experiments from TUD and HZDR. Once validated, simulations will be performed to cover a wide range of process parameters as basis for virtual controller design and demonstration. The work comprises both high level CFD development and physical analyses of results, together with groups at universities Delft, Dresden and different industry partners. In particular, the PhD candidate will spend secondments of few months in total for technical and scientific training at SHELL (The Netherlands), FRAM (The Netherlands), Technical University of Delft (The Netherlands) and Technische Universität Dresden (Germany). The PhD degree will be awarded by Institut National Polytechnique Toulouse, France.
Requirements
• Distinct university graduation in engineering or physics, preferably in fluid mechanics, two phase flows and numerical methods (CFD)
• Strong experience in CFD
• Strong interest in interdisciplinary scientific work
• Good proficiency in English language

Starting Date: 1st March 2018
Contract: Full-time contract for 36 months
Salary: 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.

Information: Prof. Dominique Legendre - Primary Supervisor
Email: legendre@imft.fr

Application: Please submit your application (cover letter, CV, certificates) to the Primary Supervisor with indication of the position reference number TOMOCON-ESR6.

DEADLINE 25.10.2017

Eligibility: The candidate recruited in the TOMOCON project must be Early-Stage Researcher (ESR) and undertake transnational mobility (secondments, trainings, conferences). The candidate must be in the first four years from the date when the researcher obtained the degree entitling him or her to embark on a doctorate (e.g. master degree). It will be counted backward from the date of recruitment (in this case 01.03.2018). No doctoral degree has been awarded during these four years. The candidate can be of any nationality. The candidate must not have resided or carried out her/his main activity (work, studies, etc.) in France for more than 12 months in the 3 years immediately before the recruitment date. Compulsory 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.