Opening for PhD position

Smoothed Particle Hydrodynamics for simulation of multiphase flows

Institute of Fluid-Flow Machinery, Polish Academy of Sciences, Gdańsk, Poland

About the project

In the framework of Marie Skłodowska-Curie Actions, Innovative Training Network European Industrial Doctorate (ITN-EID), the project COMETE is focused on the development of computational methods and a network of competence to extend the applicability of state-of-the-art formulations to industrially-relevant multiphase turbulent flows. The targeted applications involve the transport of particles/droplets in two-phase flows with gas-liquid or liquid-liquid deformable interfaces, which are ubiquitous in process, chemical, and power engineering. These applications are at the crossroads between academic research and practical concerns (e.g. particle deposition in boiling flows, droplet coalescence/breakup in emulsions, freezing/defreezing in heat pipes or changes in two-phase flow patterns) and their modeling in an industrial context represents a major challenge. We will build an international network of excellence by putting forward training-through-research and training-on-the-job activities, and we will form PhD students to deal with the scientific methodologies for complex industrial applications.

The multidisciplinary topics addressed in COMETE are scientifically challenging and of high technological and economical relevance, promising interesting career perspectives in academic and multi-sectorial industrial environments. Within the project, a total of 3 PhD positions (Early Stage Researcher) are available at the University of Udine (Italy), Vienna University of Technology (Austria) and IMP PAN (Gdańsk, Poland).

The offer

We offer a PhD position in the Multiphase Flow Group, IMP PAN Gdańsk, Poland (www.imp.gda.pl/en). A full time (40 h/week), fixed-term work contract is offered for 3 years. The gross salary, including the mobility allowance, is 2668.06 €/month. The family allowance, if eligible, amounts to 500 €/month. The PhD candidate will be based at the IMP PAN and secondments totalling 18 months are foreseen at partner institutions of the network, in particular at ESTECO (Trieste, Italy). The candidate will participate in schools and workshops of the project, and will present his/her research findings at international conferences. COMETE is offering its young researchers a training platform combining theoretical modelling, numerical simulations, experiments, and interactions with industrial partners.

Tasks

The project is of theoretical and numerical nature: it involves simulations of two-phase flows with interfaces, applying a Lagrangian approach of Smoothed Particle Hydrodynamics (SPH). The candidate will use and further develop in-house codes, introducing new physical and mathematical models. The work will be carrried out in collaboration with the COMETE project partners. The PhD thesis will be submitted to IMP Gdańsk. For further information, please contact Prof. Jacek Pozorski by phone (+48 58 5225145) or email (jp@imp.gda.pl).

Requirements

We are looking for a motivated candidate with intellectual curiosity, willing to work in the international research environment against tight deadlines, ready to gain experience also in industry, ready to share his/her PhD timespan between Poland and Italy (for the industrial secondment). Specific requirements:

- a master degree in engineering (mechanical, chemical, aerospace or related field), physics or applied mathematics,
- candidate in the first four years of his/her research career (ESR), no doctoral degree
- very good knowledge of numerical methods and fluid dynamics; familiarity with multiphase flows will be a plus
- knowledge of Linux OS and programming languages: Fortran, C++, Python or alike (for the numerical data postprocessing)
- operational knowledge and development experience of CFD software and/or parallel computing and/or GPU programming will be an asset
- good command of written and spoken English
- good analytical, mathematical, management and communication skills.

Selection procedure

The COMETE partners do strictly adhere to the ethical standards of the European Charter for Researchers and Code of Conduct for the Recruitment of Researchers[1]. Female candidates are particularly encouraged to apply and in case of equal qualification will be recruited preferentially. Applicants must satisfy some eligibility rules, in particular in terms of transnational mobility.[2] A strict equal opportunity, gender-neutral and internationally comparable recruitment procedure is implemented. The offer has also been published on the EURAXESS web site: https://euraxess.ec.europa.eu/jobs/372569.

Submission of applications will be possible starting from 1 February through April 15, 2019.

The applications should include a cover letter, CV, photo, all transcripts, diplomas, list of publications (if any), and contact information for two reference persons. As the motivation for fundamental scientific research of practical relevance is essential, applicants are required to point out in their cover letter how the project will build upon their previous education, research and competence.

In the evaluation of which candidate is best qualified, emphasis will be placed on education, experience and personal suitability, as well as motivation, in terms of the qualification requirements specified in the advertisement.

Please submit your application by regular mail to: IMP PAN, Fiszera 14, 80-231 Gdańsk, Poland or by e-mail to job@imp.gda.pl with the annotation / subject line: "PhD application: ITN-EID COMETE".

If needed, selected Candidates may be invited for an interview (in person or via videoconference on Internet).

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[1] https://euraxess.ec.europa.eu/jobs/charter
[2] http://ec.europa.eu/research/mariecurieactions