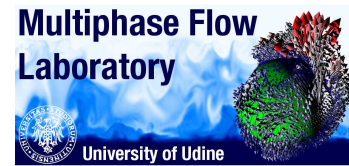




Opening for PhD Position
Multiphase Flow Laboratory
Department of Engineering and
Architecture - University of Udine
Head: Prof. Cristian Marchioli



Particle-droplet interaction in turbulent three-phase flows

Description:

The Multiphase Flow Lab of the University of Udine invites applications for a PhD Position in

Simulation of particle-droplet interaction in turbulent three-phase flows

for 3 years, 40 hours per week, in the group of Prof. Cristian Marchioli. The research of the group is devoted to computational and experimental research on incompressible flows with a focus on multiphase flows.

Project description:

Aim of this project is to develop an innovative multiscale computational approach for three-phase turbulent flows that goes beyond classical RANS-based CFD methods and can be applied to flow configurations of industrial interest in a computationally efficient way. In particular, the approach must be able to take into account the effects of the different scales affecting the system. The three phases targeted are: small solid particles, large (deformable) liquid droplets and a liquid carrier fluid. We propose to study such a system via an Eulerian-Lagrangian methodology based on both direct numerical simulation (for benchmarking) and large-eddy simulation (for industrial flows) of turbulence, coupled with an extended formulation of the Phase Field method to capture droplet-interface dynamics in the presence of droplet-to-fluid viscosity and density difference.

Requirements:

The successful candidate must hold a master degree in any of the following disciplines: Aerospace, Mechanical Engineering, Chemical Engineering, Physics, Applied Mathematics or any related field.

We are looking for a motivated scientist having a profound knowledge of fluid mechanics and excellent numerical skills. Therefore, the ideal candidate should possess previous experience in Computational and/or Experimental Fluid Mechanics. It will be advantageous to have good knowledge of any of following areas: Multiphase Flows, Numerical approaches to Turbulence (Direct and/or Large-Eddy Simulation), Experimental techniques.

The successful candidate will work in a research group with cutting-edge expertise in Multiphase Flow, which will support the proposed research by providing a conducive environment. The candidate is expected to present research at conferences and participate to school and workshops. Good analytical, mathematical, project management and communication skills, as well as good command of the English language are required.



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Tasks:

The project is in the frame of a European Marie-Curie Network (COMETE) and involves the simulation of turbulent three-phase flows (laden with droplets and solid particles). The candidate will use codes for the simulation of turbulent flows of drops existing in the Laboratory and will introduce new numerical models. The work will be carried out in close cooperation with the other network partners (academic partners: TU Wien, IMP-PAN Gdansk; non-academic partners: Euro Heat Pipes, Belgium and ESTECO, Italy). The candidate will co-work half of his time at the premises of Euro Heat Pipes, located in Nivelles, Belgium. This industrial secondment will be focused on the experimental development of improved freezing/thawing procedures for Ammonia Heat Pipes.

The position provides the opportunity for submission of a PhD thesis to the University of Udine.

Stipend:

The successful candidate will be enrolled by the University of Udine with a 3-year fixed-term contract, full health and safety insurance coverage and a monthly remuneration of 4,013.88 € (pre-tax, 12x per year). In addition, the successful candidate is eligible for a lump family allowance of 18,000.00 € should he/she have family, regardless of whether the family will move with the candidate or not.

Selection:

Submission of applications will be possible from January 28, 2019 until March 29, 2019. In case of equal qualification, female candidates will be recruited preferentially.

Please submit your application including cover/motivation letter, CV, photo, all transcripts, and contact information for two reference persons by regular mail to:

University of Udine, attn. Prof. Cristian Marchioli, Dipartimento Politecnico di Ingegneria e Architettura, via delle scienze 206, 33100, Udine (Italy)

and/or by e-mail to: marchioli@uniud.it.

with the subject line:

"Application for PhD Studentship - ITN-EID COMETE 813948".

Candidates may also ask for a Skype interview.

Contact: Enquiries for further details can be sent to Prof. Cristian Marchioli (marchioli@uniud.it).