

Postdoctoral proposal

Topic: interfaces in reactive flows,
M2P2 lab, Marseille.

Summary:

This project aims at developing a unified modelling method for flows that are both multiphase and reactive. Such complex flows are present in many applications. In cryogenic rocket engines, for instance, liquid oxygen is injected straight into the combustion chamber. The liquid jet is consequently strongly destabilised and atomised, before evaporating and burning with the surrounding hydrogen. Today, the processes corresponding to the liquid jet destabilization and to the combustion are tackled separately, without an appropriate coupling: no flow model has the capability of modelling both the multiphase and reactive aspects, whilst admittedly strongly coupled. The objective is to develop a new model, allowing an accurate simultaneous representation of interfaces, phase transfer and combustion. For this, previous works [references available on request] will be extended as to encompass reactive flows. Validation will then be carried out on both multiphase and reactive academic test cases.

Job description:

The work will be carried at M2P2 (Pierre Boivin), in close collaboration with IUSTI (Jacques Massoni and Olivier Le Métayer). The two labs are within 5min walking and belong to the Fabri de Peiresc Federation.

<http://www.m2p2.fr/>

Essential skills:

Strong background in scientific computing (Fortran preferred), reactive and/or multiphase flows.

Proficiency in scientific writing.

Desired skills:

hyperbolic methods, HPC

Gross salary: from 2423 € to 2843 €/month depending on qualification and experience.

Funding is for 1 year.

Application:

Email CV, cover letter to pierre.boivin@univ-amu.fr

Intended Start date: now to 1-september-2018.