



## Call for Postdoc

**Title: Advanced Lattice Boltzmann modelling for reactive flows**

**Domain: turbulent combustion, LBM**

**Project: Advanced Lattice-Boltzmann Modelling of Combustion  
Méthodes Avancées Lattice-Boltzmann En Combustion (MALBEC)  
funded by the French National Research Agency (ANR)**

### Description

Lattice Boltzmann (LB) solvers are becoming an ever more attractive alternative to traditional Navier-Stokes solvers. Reactive flow modeling in the LB framework, however, remain relatively marginal within the scientific community: most Lattice-Boltzmann schemes are limited to athermal flows.

Based on recent developments at M2P2, simulating reacting flows now seem within our grasp. A significant research effort is however required to achieve this target on realistic flows, e.g. including multi-level grid capabilities, the derivation of novel boundary conditions, turbulence models.

Development of such methods within the field of combustion is the topic of this post-doctoral position.

### Expected profile of the candidate

The candidate will have a PhD in computational fluid dynamics, with experience in either LBM or numerical combustion. The numerical developments required will involve team-working skills to interact frequently with other postdocs/PhD students working on the same code, software engineers, associated industrials and supervisors.

**How to apply**

Send an application to: [Pierre.Boivin@m2p2.fr](mailto:Pierre.Boivin@m2p2.fr) including:

- A detailed CV
- A cover letter

**Starting date:** when available, from Oct. 2020 to Feb. 2021.

**Contract duration:** one year, renewable every year.

**Deadline to apply:** 20/12/2020

**References**

- [1] Y. Feng, M. Tayyab, and P. Boivin, "A lattice-boltzmann model for low-mach reactive flows," *Combustion and Flame*, vol. 196, pp. 249 – 254, 2018.
- [2] Y. Feng, P. Boivin, J. Jacob, and P. Sagaut, "Hybrid recursive regularized thermal lattice boltzmann model for high subsonic compressible flows," *Journal of Computational Physics*, vol. 394, pp. 82 – 99, 2019.
- [3] G. Farag, S. Zhao, T. Coratger, P. Boivin, G. Chiavassa, and P. Sagaut, "A pressure-based regularized lattice-boltzmann method for the simulation of compressible flows," *Physics of Fluids*, vol. 32, no. 6, p. 066106, 2020.
- [4] M. Tayyab, B. Radisson, C. Almarcha, B. Denet, and P. Boivin, "Experimental and numerical lattice- boltzmann investigation of the darrieus-landau instability," *Combustion and Flame*, vol. 221, pp. 103–109, 2020.
- [5] M. Tayyab, S. Zhao, Y. Feng, and P. Boivin, "Hybrid regularized lattice-boltzmann modelling of premixed and non-premixed combustion processes," *Combustion and Flame*, vol. 211, pp. 173–184, 2020.