

POST-DOCTORAL RESEARCH FELLOWSHIP



Plasma for micro-combustion: proof of concept

The miniaturization of electromechanical engineering devices observed during the last decade requires high energy densities. These are made possible by micro-reactors based on combustion, as this process releases at least 100 times more energy than batteries. However, downscaling a reactor from macro to micro increases its area/volume ratio and, consequently, the heat and active species losses at the walls, thus reducing the stable operating range of the combustion. The project is to verify experimentally whether micro-plasma discharges in a catalytically coated micro-reactor intensify the combustion process.

The postdoctoral fellow will be responsible for the design of the microreactor, the studies of the physics and chemistry of plasma and combustion, and the qualification of the micro-combustion regimes at atmospheric pressure of various fuels.

The postdoctoral fellow will have the opportunity to use and improve several optical techniques to characterize the discharges and the combustion. Two laser systems, one nanosecond (7 ns) and the other picosecond (26 ps), will be available to develop TALIF, E-FISH or other diagnostics.

The postdoctoral fellow will conduct the experiments with plasma at LPP (Dr Svetlana STARIKOVSKAIA) and those in combustion at UCP ENSTA (Prof. Laurent CATOIRE) on the same campus.

Your profile:

- You have experience in plasmas at atmospheric pressure and their characterization (laser diagnostics, fast imaging, electrical measurements).
- You have a PhD in physics, laser diagnostics, combustion, plasma or a related discipline.
- You have excellent theoretical and practical knowledge within one or more of the following areas: laser, plasma and combustion physics and diagnostics.
- You have an outstanding scientific track record.
- You have strong working skills, both autonomously and collectively, and good communication skills, in French and English, both written and oral.

Host Laboratory: Laboratory of Plasma Physics, LPP (UMR7648)

Profile of the candidate: PhD, recent experimental thesis in laser diagnostics, plasma or combustion

Requirements: autonomy in research, writing, supervision of younger research staff

Language: fluent writing and communicating in French for internal documentation; fluent English for communication and dissemination of results

Citizenship: EU

Start date: January 1st 2023

Duration: 1 year with possibility of prolongation for the duration of the Project (**3 years**)

Application: a cover letter describing your research interests, motivation and goals, (2 pages max.), your list of publications highlighting your most relevant peer reviewed works, your CV and 2 recommendation letters.

To be sent to:

svetlana.starikovskaia@lpp.polytechnique.fr

