

Postdoctoral Position (Plasma Physics for medical applications) LPP at Sorbonne Université, Paris, France

The **Laboratory of Plasma Physics (LPP, UMR 7648)** (Sorbonne Université, Paris, France) invites applications for a postdoctoral researcher in plasma physics to develop and characterize **cold atmospheric plasma (CAP) sources and diagnostics** in support of a multidisciplinary program targeting **liver fibrosis and tissue remodeling**.

Scientific background

Fibrosis modulation by CAP requires quantitative control of plasma chemistry and delivered reactive species at the plasma-liquid/tissue interface. This project focuses on the physics of atmospheric-pressure discharges and their physico-chemical outputs (RONS generation, transport and conversion), with the goal of establishing reproducible, traceable plasma operating modes that can be correlated with biological readouts in liver-relevant models. The work is embedded in a broader interdisciplinary effort (liver biology, advanced human 3D models, proteomics/omics), but the postdoc will primarily drive the plasma source engineering, diagnostics and data-driven signatures that enable mechanistic interpretation.

Main responsibilities

Under the supervision of **Dr Thierry Dufour (PI)**, the postdoctoral researcher will contribute to plasma-physics tasks and the interface with biological partners, including:

Cold atmospheric plasma source development

- Contribute to the development/optimization of chemically tunable CAP sources with robust operation, compatible with biomedical constraints and suited to humid environments; when relevant, consider operation in confined / endoscopy-like geometries (duct- or cavity-like conditions).
- Fine-tune electrical parameters (micro-/nano-pulsed power supplies, repetition rate, pulse width, amplitude) while meeting thermal/electrical safety constraints and ensuring treatment reproducibility.

Plasma physico-chemical characterization

- Implement diagnostics and measurements such as mass spectrometry, optical emission spectroscopy (OES), fast ICCD imaging, and infrared imaging, including spatio-temporal analysis of ionization waves and estimation of gas/electron temperature, electron density, electric field, and key reactive species (e.g., O, OH, N₂*).
- Develop calibrated characterization protocols on representative cavity/duct-like models when needed (to mimic confined geometries), and verify non-ablative operating conditions (typically < ~35°C at the target), alongside uncertainty/reproducibility assessment.

Support to in vivo/ex vivo campaigns (physics-bio interface)

- Support preclinical experiments (murine and porcine models, as relevant) to ensure reproducible plasma exposures and traceability of the key physical parameters (delivered energy, signatures, temperature constraints, geometry).
- Work closely with biologists/immunologists and clinical endoscopists within the consortium to translate plasma measurements into interpretable descriptors of the delivered physico-chemical "dose".

Scientific dissemination

Prepare manuscripts, conference presentations, and contribute to valorization/IP related to the device as the project advances.

Candidate profile

Required

- PhD in plasma physics, applied physics, electrical engineering/physics, or a closely related field.
- Strong hands-on experience with atmospheric-pressure cold plasmas, pulsed high-voltage discharges, instrumentation and diagnostics (e.g. OES, ICCD, IR, MS, electrical measurements).
- Ability to work in a highly interdisciplinary environment, strong experimental rigor, and safety culture.

Desirable

- Experience with plasma chemistry control/quantification, plasma-liquid interaction, or kinetic/transport reasoning at atmospheric pressure.
- Experience with optical instrumentation calibration, hyperspectral systems, synchronized acquisition and data processing (Python/Matlab).
- Interest in prototyping and supervision of students/interns.

Position details

- Location:** Laboratory of Plasma Physics (LPP), at Sorbonne Université, 4 Place Jussieu, Tower 34, Stairs 4, 75005 Paris.
- Duration:** 18 months (6 months + 12 months).
- Starting date:** flexible but ideally between April and June 2026
- Salary:** following French public research scales & experience.

To apply, send as a single PDF:

- CV (including publications list),
- Cover letter (1-2 pages) describing relevant HV, diagnostics, plasma experience and motivation for interdisciplinary work
- Support letter: at least 1.

Contact / PI: Thierry Dufour

thierry.dufour@sorbonne-universite.fr