

Postdoc: “Surface machining using temporally and spatially shaped pulses”

**Laboratoire Hubert Curien, CNRS UMR 5516 Université Jean Monnet, Saint Etienne
Optics and Photonics Department / Radiation-matter interaction Group**

The “Optics and Photonics” department (Laser-matter interaction group) at the Laboratoire Hubert Curien, CNRS UMR 5516, Jean Monnet University in Saint Etienne, France, is currently seeking a postdoctoral candidate for its research activities. Applications are invited for a position that will open in November 2021. The position is for 18 months.

Environment: The Hubert Curien Laboratory is a mixed research unit, jointly run by the “Centre National de la Recherche Scientifique - CNRS” and the Jean Monnet University. The proposed subject concerns laser-assisted transformation of bulk optical materials on micro- and nanoscales. The Ultrafast laser platform located at the Hubert Curien Laboratory hosts state-of-the-art equipment for beam engineering, laser processing, and process characterization.

Project: Ultrafast laser pulses can be efficiently used to manufacture surface features with designer shapes and scales. We are aiming here to develop sub-diffraction-limited laser machining strategies for surface structures relying on non-trivially shaped pulses, boosting thus new material functions. The shaping method involves spatial, temporal and polarization tailoring of intense optical pulses.

Job description: The activity will focus on the implementation of a pulse shaping experiment targeted at surface processing. The experiment will rely on open and feedback loops and optimization algorithms to achieve structures that could not be attained without advanced shaping strategies. The work will necessitate the implementation of in-situ measurements of the fabricated surfaces to feed the optimization algorithm of the pulse shapers complimented by microscopic observations (SEM, TEM) for ex-situ observation of the final results. The tasks will inqually involve collaborative work with group theoreticians with the objective to design interesting pulse shapes and rationalize obtained structures.

Candidate profile: We are looking for a highly motivated researcher with an interest in fundamental and experimental physics and a strong background in optics and materials. Experience in developing optical systems and in the utilization of lasers is required. Candidates should have a PhD degree in physics or engineering and show interest for interdisciplinary work in the field of laser-material interactions. The application should be supported by sound academic records and recommendation letters. Expertise is required in the following areas: ultrafast laser-material interactions, condensed matter, microscopy, solid-state physics, spectroscopy, ultrafast optics, laser-induced ultrafast phenomena, mechanics. Programming skills and fluence in scientific English are also required.

Payment: Postdoctoral fellowship (net salary 2000-2500€ dependent on previous experience)

Duration: 18 months,

Application Deadline: 01/09/2021

Contact (join a CV, application letter and recommendation letters)

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Note: The Laboratoire Hubert Curien is a restricted access area. The fellowship is conditioned by a security clearance, to be applied for during the application (two months process time). We need the following documents: exhaustive CV, passport copy.