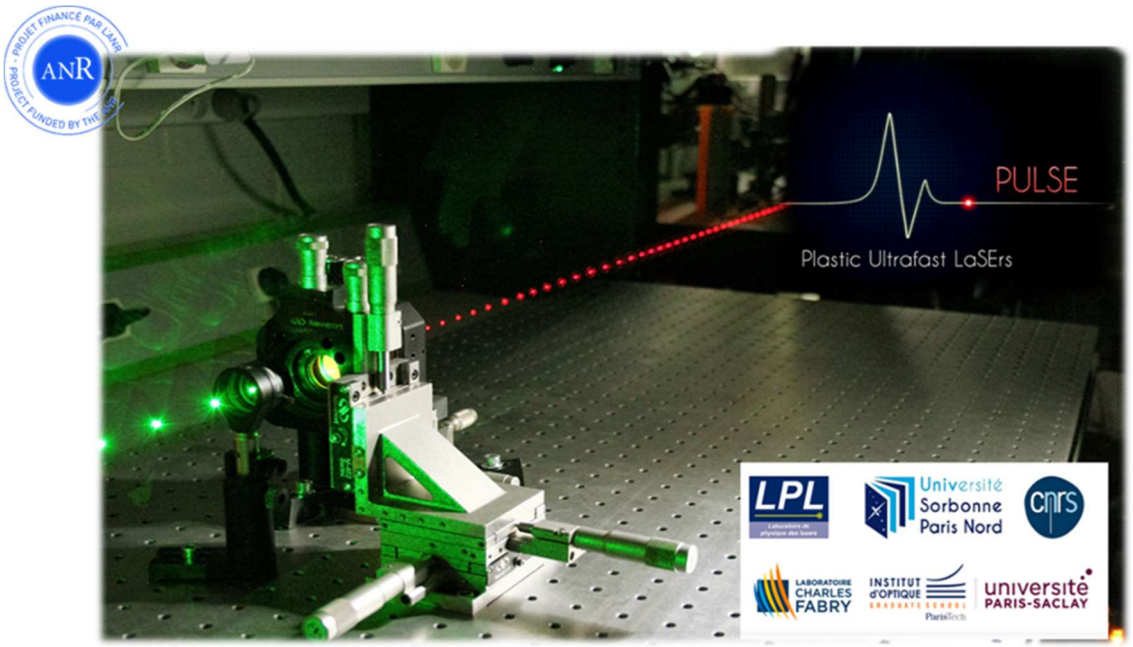
Post doc position available

To be started from October 2021

This 12-month position is associated to the ANR project "Plastic Ultrashort Lasers". The candidate will work within the Laser Physics Lab (Université Sorbonne Paris Nord and CNRS, Villetaneuse, France) in collaboration with Laboratoire Charles Fabry at Institut d'Optique Graduate School.

Team website : Equipe Photonique Organique et Nanostructures – Lasers Organiques Solides

Ultrafast organic photonics



Today's optoelectronics are based on a small amount of non-sustainable materials (like gallium or rare-earth minerals) that involve complex and costly technologies for building a working device out of bare materials. New technologies have emerged that hold the promise of low-cost devices with original functionalities. It is especially the case for **organic optoelectronics,** illustrated by the fast progress of OLEDs (Organic Light Emitting Diodes), which are poised to become the dominant mobile display technology.

Organic lasers are lasers whose gain material consists of a thin film of an organic semiconductor medium. They can be made on flexible or biocompatible substrates, with low-cost solution-processing techniques, and the wide range of available materials enables to cover the whole visible spectrum. Organic lasers remain mostly fundamental research objects, but they also found application perspectives in bio or chemosensing, Visible Light Communications, or all-integrated photonic circuits. However, the performance of organic lasers is today limited : electrical pumping remains elusive, and they cannot operate in a true continuous-wave (CW) regime but are instead limited to emit pulses (typ. < 100 ns) at low repetition rates.

The objective of the ANR project PULSE (for Plastic Ultrashort LaSErs), started in 2021, is to demonstrate the possibility of obtaining laser operation in unprecedented temporal regimes, namely an *ultrashort pulse regime with high repetition rates* . This could represent a major breakthrough in the field and open the way for novel applications.

Global strategy consists in implementing recently developed organic materials in innovative laser architectures.

This project is a collaborative work between the Organic Photonics group at Laser Physics Lab (S. Chénais, S. Forget) in Université Sorbonne Paris Nord (Villetaneuse), and the Laser Group at Laboratoire Charles Fabry (LCF), Institut d'Optique Graduate School (P.Georges, F.Druon) in Saclay. Other collaborations in relation with this project are also active with several groups of chemists in France and the Adachi group in Kyushu University, Japan.

We're looking for a highly-motivated post-doc who will be in charge of designing and conducting experiments and modelling. Experiments will be lead in tight connection with simulations for an optimal resonator design. Frequent interactions and some travels to LCF in Paris-Saclay will be required for the ultrafast laser characterization.

Essential requirements :

- Holding a PhD in experimental physics involving an experience in working with lasers
- A strong background in photonics and laser physics
- Abilities for simulation work
- A strong appetite for interdisciplinary work, and capacities for teamwork

The following are desirable but not mandatory requirements :

- Experience with mode-locked lasers / with 2D materials as saturable absorbers
- Background in organic photonics / photophysics of organic molecules

Location : Université Sorbonne Paris Nord (ex université Paris 13), Laboratoire de Physique des Lasers, 93430 Villetaneuse (France). The university is conveniently located at 30 mn from Paris Gare du Nord with a large panel of accessible public transportation (Lines H, T11, T8)

Duration : Minimum 12 months. Starting date not before October 2021.

Salary : depends on the candidate's prior experiences, around 2200 € net per month.

Contacts : Sébastien Chénais (sebastien.chenais@univ-paris13.fr)

Sébastien Forget (sebastien.forget@univ-paris13.fr)