



Postdoc offer:

Development of a compressed wavefront sensor with a thin scattering Hartmann-mask

We offer a 15-month postdoc position (renewable 15 months) starting on January 2021, funded by the french national agency (ANR) for developing a compressed wavefront sensor. This project is part of a joint researcher activity involving three academic laboratories (SPPIN, IdV and LULI) and one industrial company (Imagine Optic).

Scientific context:

Wavefront sensing is a very handy technique for measuring the spatial phase of a beam. However, in many applications ranging from metrology to biological imaging, single-shot, multispectral and high-resolution wavefront acquisitions of complex light-beams must be achieved. Single-shot acquisition is especially critical in the case of ultra-short laser pulses delivering few pulses a day like the multi-petawatt Apollon laser facility.

In this project, wavefront-sensing will be achieved relying on recent advances in image processing and taking advantage of the spatial and spectral properties of complex scattering media. The group in Paris published several works supporting this project, in particular about high-resolution wavefront sensing with a diffuser [1], spectro-spatial properties of scattering media [2] and compressed imaging [3]. The host in polytechnique is responsible for the Apollon laser facility.

[1] [P. Berto et al., Opt. Lett., 42\(24\) 5117 \(2017\)](#); [2] [L. Zhu et al., Optica 7\(4\), 338 \(2020\)](#); [3] [M. Pascucci et al., Nat. Commun. 10, 1327 \(2019\)](#).

Location:

Research works will mostly take place at SPPIN laboratory, in the heart of Paris. Some experimental developments will also have to be achieved directly upon the Apollon PetaWatt laser facility, a Paris-Saclay infrastructure depending on the LULI laboratory at Ecole Polytechnique.

Education requirements:

The successful candidate will have a PhD in optics and a high experience in experimental optics. The candidate must also demonstrate expertise in one of the following topics: computational imaging, ultra-short laser physics, wave propagation in complex media.

Contact:

contact: Marc Guillon (marc.guillon@u-paris.fr, <https://www.sppin.fr/members/marc-guillon/>)
Dimitrios Papadopoulos (papadopoulos.d@bureau.luli.polytechnique.fr)