

Postdoc position:

Photochromic materials for optical neuromorphic computing

A 1-year post-doctoral position is open in the framework of the project [CANAPO](#)* funded by the Labex Nano-Saclay, from Paris-Saclay University. The objective of this multidisciplinary project is to assess the feasibility of using photochromic materials in neuronal optical networks in view of photonic machine learning. The goal of the postdoctoral project is to characterize the photophysical and optical-switching characteristics of thin-films based on two classes of photochromic dyes, namely azobenzene and diarylethene derivatives. The optimized material will be implemented in a model artificial optical synapse for the weighted connection of two optical neurons.

The postdoctoral fellow will be hired by « Laboratoire de photophysique et photochimie supramoléculaires et macromoléculaires » (PPSM, ENS Paris-Saclay) and the research activity will take place both in PPSM and in « Service de Physique de l'État Condensé » (SPEC, CEA-Saclay, Orme des Merisiers site) the two labs being geographically very close. The project also involve C2N for implementation of the developed materials into neuronal optical networks.

Main duties and responsibilities:

- Processing organic dyes in solution, polymer matrices and thin films.
- Measurement and analysis of photokinetics by transient optical absorption (second to millisecond)
- Contribution to the interpretation in terms of photochemical and photophysical processes and mechanisms.
- AFM measurement and analysis of optically induced surface reliefs produced by patterned laser excitation on polymer films.
- Definition, implementation and demonstration of a model artificial optical synapse for interconnecting two optical neurons.

Required Knowledge, Skills, and Abilities:

The applicant should have completed a PhD in photophysics or photochemistry involving organic materials and should have acquired a general expertise in the following domains:

- Photophysical or photochemical processes taking place in organic dyes.
- Laser spectroscopy and optical instrumentation.
- Practice in handling organic dyes in solution, polymer matrices, thin films formation, ...
- Excellent communication skills to coordinate regularly with all partners of the CANAPO project.

Conditions of eligibility to Labex fundings:

- The applicant should have obtained a PhD less than 5 years ago, in a laboratory different from the partners of this project (C2N, SPEC, PPSM).
- A thematic or geographical mobility of 2 years is required for PhD and post-docs from NanoSaclay member laboratories.

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* http://nanosaclay.fr/Phoce/Vie_des_labos/News/index.php?id_news=635