Laboratory for Optics and Biosciences

ECOLE POLYTECHNIQUE
INSERM - CNRS - IP Paris

Postdoc - Advanced multiphoton microscopy of large samples

Laboratory for Optics and Biosciences, Ecole Polytechnique, Palaiseau, France

The "advanced microscopies and tissue physiology" group at the Laboratory for Optics and Biosciences (LOB), Ecole Polytechnique, Palaiseau, France, is seeking one or two talented postdoctoral scientists with background in instrumentation/optics or bioimage informatics, and interest in interdisciplinary biomicroscopy research.

The work will be carried out within the framework of the 'HOPE' project funded by the European Research Council (ERC). Candidates should have experience in optics and programming, and should be motivated to work within an interdisciplinary research program. Previous experience in one or several of the following topics would be an asset: wavefront shaping, adaptive optics, light-sheet microscopy, advanced multiphoton techniques, microscope design and implementation, machine learning, image processing automation.

Projects. The successful candidate will develop approaches for large volume and in-depth imaging of live and large samples. Possible projects include:
(i) Multiphoton light-sheet microscopy. Starting from an existing prototype optimized for embryo imaging (https://doi.org/10.1364/BOE.400113; https://doi.org/10.1038/nmeth.2963), the project will explore Bessel and color excitation, and implement a new setup dedicated to fast intact tissue imaging.
(ii) Adaptive optics for deep-tissue microscopy. Based on an existing dual-color 3-photon platform (https://doi.org/10.1038/s41377-018-0012-2; Ferrer Ortas et al, to appear), the project will explore adaptive optics strategies for longitudinal imaging in zebrafish and mice.
(iii) Workflow for large-volume reconstructions and analysis. The project will take advantage of a recently optimized version of our color serial multiphoton imaging scheme (https://doi.org/10.1038/s41467-019-09552-9), and push its application to high-resolution mapping of hippocampal lineage and connectivity. The work will involve the optimization of a workflow for acquisition and analysis of large images.

Environment. Ecole Polytechnique is located in the Paris-Saclay area, 25 km South from Paris. The LOB has extensive expertise in multiphoton imaging, and develops advanced microscopy and bioimage informatics approaches for studying developing tissues. The candidate(s) will have access to optics rooms with functional prototypes, state-of-the art femtosecond sources, local workshops, biology facilities, and storage/computing servers. He/she/they will have daily contacts with 3-4 persons, weekly meetings with the LOB microscopy group, and interactions with the consortium collaborators at Institut de la Vision (Paris) and INMED (Marseille).

The appointment will be for 18 months with possible extension, funded by the ERC. Salary will be according to the CNRS rules and depending on experience. Starting date will be in 2023 with some flexibility.

Contact. More information about the projects and work environment can be requested informally via email: send a short presentation and CV to E.Beaurepaire (emmanuel.beaurepaire@polytechnique.edu).

Interested candidates can apply before December 10th 2022 on the following portal: https://emploi.cnrs.fr/Offres/CDD/UMR7645-EMMBEA-002/Default.aspx?lang=EN. Applications will be reviewed on a rolling basis.

For more information on research at LOB microscopy group, please visit: https://portail.polytechnique.edu/lob/en/research/advanced-microscopies-tissue-physiology