PostDoc

"Multisensory signal processing:
From brain-wide neuronal circuits to behavior"

A joint PostDoc position is available in the Laboratory Jean Perrin in Paris in the group of Dr. Volker Bormuth (Assistant Professor) and the co-headed group of Dr. Georges Debrégeas (Research Director) and Dr. Raphaël Candelier. The Laboratory Jean Perrin pioneered functional whole-brain imaging in zebrafish larvae with one and two photon light-sheet microscopy. We use and further develop this technique to study brain-wide neuronal circuits of sensory to motor integration. [1-3]

Job Description: The candidate will engage in a multidisciplinary research program at the interface between neuroscience and biophysics, microscopy development and statistical physics to study multisensory signal processing in the brain. We recently built a prototype of a novel *rotatable* light-sheet microscope (unpublished) in which a restrained larva can perform multisensory tasks in a vestibular and visual environment, as a pilot in a flight simulator. But in the case of the larvae, we can follow at the same time *in vivo* the dynamics of every single neuron in the animal brain. Multisensory behaviors emerge from population activity in neuronal networks. With our development, we now aim to quantify these emerging properties and to test circuit based and probabilistic models of multisensory cue integration.
The candidate further develops the system, conducts psychophysical experiments and performs whole-brain activity scans and consecutive data analysis and modeling.

Desired skills: Strong background in neuroscience or biophysics; Matlab-based image and signal processing; Labview programming; neuronal circuit modeling; electrophysiology; zebrafish genetics; motivation

Start date: flexible but preferably in spring 2016.

Please send your application letter including CV, list of publications and 2-3 references via email to:

Volker Bormuth
University Pierre and Marie Curie
4, Place Jussieu
75005 Paris
volker.bormuth@upmc.fr

Web pages: Laboratory Jean Perrin ; ENP profile Bormuth ; ENP profile Debrégeas

1. Wolf, S. *et al.* Whole-brain functional imaging with two-photon light-sheet microscopy. ***Nature Methods*** 12**,** 379–380 (2015).
2. Panier, T. *et al.* Fast functional imaging of multiple brain regions in intact zebrafish larvae using Selective Plane Illumination Microscopy. ***Front Neural Circuits*** 7**,** 65 (2013).
2. Olive, R. *et al.* Rheotaxis of Larval Zebrafish: Behavioral Study of a Multi-Sensory Process. ***Front. Syst. Neurosci***. 10**,** (2016).