

PostDoc

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

A PostDoc position is available in the Laboratory Jean Perrin in Paris funded by an ERC starting grant. 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 multi sensory and motor integration. ¹⁻³

Job Description: The candidate will engage in a multidisciplinary research program at the interface between experimental and computation neuroscience, microscopy development and statistical physics to study multisensory signal processing in the vertebrate brain. We recently built a novel *rotatable* light-sheet microscope (Migault et al. Current Biology 2018) in which a restrained zebrafish larva can perform multisensory tasks in a vestibular and visual environment, as a pilot in a flight simulator. At the same time, we can monitor *in vivo* the dynamics of almost every single neuron in the animal brain. With this unique platform, we aim at understanding how multisensory behaviors emerge from large-scale population activities in neuronal networks, and to test circuit-based and probabilistic models of multisensory cue integration.

The candidate further refines the system, conducts psychophysical experiments and performs whole-brain activity scans and subsequent data analysis and modeling.

Desired skills: Motivation; Solid background in neuroscience; programming: Matlab and/or Python; Neuronal circuit modeling; data science / machine learning; zebrafish genetics

Start date: Flexible

Deadline: available until filled

Please send your application letter including CV and 3 contacts for references via email to:

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Web pages:

[Laboratory Jean Perrin](#) ; [MultiSense](#) ; [ENP profile Bormuth](#) ; [ENP profile Debrégeas](#)

- S. Karpenko , S. Wolf , J. Lafaye , G. Le Goc , T. Panier , V. Bormuth , R. Candelier , G. Debrégeas
From behavior to circuit modeling of light-seeking navigation in zebrafish larvae **ELife** (2020)
- G. Migault, T.L. van der Plas, H. Trentesaux, T. Panier, R. Candelier, R. Proville, B. Englitz, G. Debrégeas, V. Bormuth. *Whole-Brain Calcium Imaging during Physiological Vestibular Stimulation in Larval Zebrafish.* **Current Biology** 28, 1-13. (2018)
- S. Wolf, A. Dubreuil, T. Bertoni, U.L. Böhm, V. Bormuth, R. Candelier, S. Karpenko, D.G.C. Hildebrand, I. H. Bianco , R. Monasson , G. Debrégeas. *Sensorimotor computation underlying phototaxis in zebrafish.* **Nature Communication** 8, 651. (2017)
- Wolf, S. *et al.* Whole-brain functional imaging with two-photon light-sheet microscopy. **Nature Methods** 12, 379–380 (2015).
- 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).
- Olive, R. *et al.* Rheotaxis of Larval Zebrafish: Behavioral Study of a Multi-Sensory Process. **Front. Syst. Neurosci.** 10, (2016).