

LadHyX Seminar – December 20, 10:45

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**Sensorimotor neural computation underlying phototaxis in zebrafish**

The zebrafish larva combines several assets – transparency, small brain dimensions, genetic tractability – that makes it a unique model system for whole-brain functional imaging. Using high-speed light-sheet microscopy, it is now possible to simultaneously record the activity of the quasi-entirety of the larva brain in vivo at single cell resolution. I will illustrate the potential of such a brain-scale approach for the study of the neuronal basis of sensorimotor integration. By correlating neural activity with gaze orientation, we were able to identify a circuit in the hindbrain that acts as a pacemaker for spontaneous eyes saccades. We further showed that the circuit is a substrate for visual integration. Its interaction with the visual pathway however differs from a simple stimulus-response pattern. Visual stimuli exert an action that depends on the circuit oscillatory phase at which they are delivered. I will discuss how this circuit may subserve phototaxis, i.e. the spontaneous navigation of larvae towards illuminated regions.