Two PhD positions in:

Neural Mechanisms of Flexible Behavior

N3I Research Line, Istituto Italiano di Tecnologia (IIT)

The Forli Lab at the Center for Convergent Technologies, Istituto Italiano di Tecnologia (Genova) is accepting applications for **2 PhD scholarships** to investigate the neural mechanisms of flexible behavior, focusing on the mouse hippocampus as a model system.

The hippocampus has a crucial role in flexible and adaptable behavior, yet its function remains debated. Traditional studies have focused on stereotyped and narrow tasks, such as navigation and contextual conditioning, resulting in fragmented models of hippocampal function. *This project adopts a novel, integrative strategy that combines systems neuroscience, theory, and cutting-edge neurotechnology* to investigate the role of the mammalian hippocampus.

The PhD student will investigate how hippocampal representations change across diverse spatial and non-spatial tasks, testing predictions of leading theoretical models in both healthy mice and mouse models of cognitive inflexibility. Leveraging cutting-edge neurotechnologies - high-density electrophysiology (Neuropixels and ultraflexible probes) and miniaturized two-photon calcium imaging (MINI2P) - they will record activity from hundreds of neurons in freely moving animals over multiple days. By systematically manipulating task structure and behavioral policies, the project will enable direct experimental tests of theoretical models of hippocampal computation, advancing our understanding of the neural basis of flexible behavior.

Requisites: We welcome international applicants with an MSc in **biology, physics, chemistry, neuroscience, engineering, or other STEM disciplines**. Given the interdisciplinary and technical nature of the project, candidates should be strongly motivated to acquire – during their PhD - new skills in experimental neurophysiology, computational modeling, and behavioral neuroscience. We particularly value curiosity, creativity, and independence, and encourage candidates to develop their own ideas and extensions within the framework of the project.

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