Several DOCTORAL and POSTDOCTORAL openings in the lab of
RAVA AZEREDO DA SILVEIRA at the IOB, University of Basel

We invite applications for several Ph.D. and postdoctoral positions at the IOB, University of Basel, in Switzerland. Research questions will be chosen from a broad range of topics in theoretical/computational neuroscience and cognitive science (see the description of the lab’s activity, below).

Candidates with backgrounds in mathematics, statistics, artificial intelligence, physics, computer science, engineering, biology, and psychology are welcome. Experience with data analysis and proficiency with numerical methods, in addition to familiarity with neuroscience topics and mathematical and statistical methods, are desirable. Equally desirable are a spirit of intellectual adventure, eagerness, and drive.

Doctoral and postdoctoral salaries will be highly competitive.

Deadline
For full consideration, please apply by 30 January 2020.

How to apply
Please send a letter of motivation, a statement of research interests limited to two pages, a curriculum vitae including a list of publications, and any relevant publications to rava@iob.ch, and arrange for three letters of recommendations to be sent to the same address. In all email correspondence, please include the mention “APPLICATION-BASEL-PHD” or “APPLICATION-BASEL-POSTDOC” in the subject header, otherwise the application will not be considered.

Description of the lab’s activity
Rava Azeredo da Silveira’s lab focuses on a range of topics in theoretical and computational neuroscience and cognitive science. These topics, however, are tied together through a central question: How does the brain represent and manipulate information?

Among the more concrete approaches to this question, the lab analyses and models neural activity in circuits that can be identified, recorded from, and perturbed experimentally, such as visual neural circuits in the retina and the cortex. Establishing links between physiological specificity and the structure of neural activity yields an understanding of circuits as building blocks of cerebral information processing. On a more abstract level, the lab investigates the representation of information in populations of neurons, from a statistical and algorithmic—rather than mechanistic—point of view, through theories of coding and data analyses. These studies aim at understanding the statistical nature of high-dimensional neural activity in different conditions, and how this serves to encode and process information from the sensory world.

In the context of cognitive studies, the lab investigates mental processes such as inference, learning, and decision-making, through both theoretical developments and behavioral experiments. A particular focus is the study of neural constraints and limitations and, further, their impact on mental processes. Neural limitations impinge on the structure and variability of mental representations, which in turn inform the cognitive algorithms that produce behavior. The lab explores the nature of neural limitations, mental representations, and cognitive algorithms, and their interrelations.