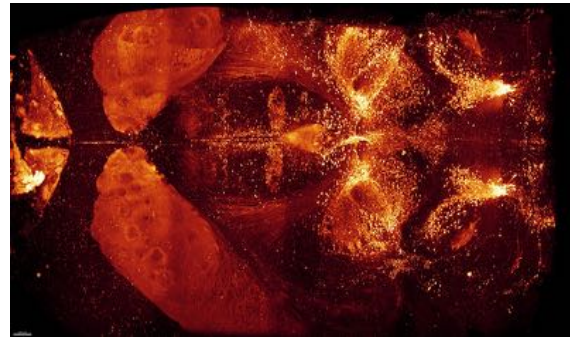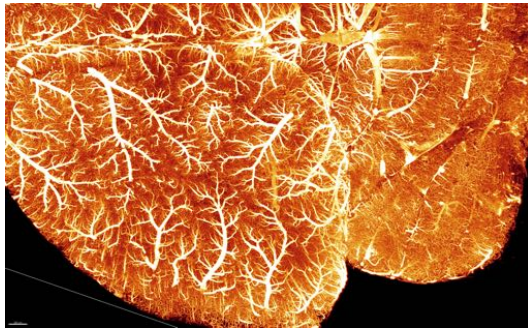# ARAMIS Lab recruits a Master student with a possible extension to PhD position

Analysis of 3D microscopic brain images at high resolution

Keywords: image processing, computer graphics, optimization, high performance computing

The INRIA ARAMIS lab and the Renier team at the Brain and Spine Institute (ICM) in Paris recruits a Master student with a solid background in image processing and high-performance computing.

Your project: The Renier team at the Brain and Spine Insitute (ICM) has developed a revolutionary technique for whole brain immunostaining and volume imaging at high resolution (https://idisco.info). This technique leads to gigantic images of up to 200 Gb showing the mouse brain at a resolution allowing the reconstruction of individual neurons and their projections within the brain.

These images of an unprecedented level of details open new perspectives for the understanding the structure and function of the brain. They also raise important challenges in terms of image processing.

The project focuses more specifically on the analysis of the variability and plasticity of networks in the adult brain. The ARAMIS Lab has developed statistical shape analysis techniques informed by series of geometric primitives such as sets of curves or surfaces (www.deformetrica.org). The student will adapt such techniques to this new kind of imaging, by proposing specific optimization and algorithmic strategies.

The project lies therefore at the boundaries between neurosciences, mathematics (differential geometry, partial differential equations), statistics and high-performance computing.

Your team: You will work at the interface between the ARAMIS lab[1] and the Renier team[2] at the ICM (Brain and Spine Institute) located at the Pitié Salpêtrière hospital, downtown Paris. The ARAMIS lab is a joint team between **INRIA**, the French national research institute for applied mathematics and

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[1] www.aramislab.fr
[2] www.renier-lab.com

computer science, and the **ICM**, one of the major neuroscience institute in Europe. The lab gathers more than 30 researchers, engineers, PhD students with background in applied mathematics and computer science.

Your profile: You are interested by neurosciences and brain disorders, and you are willing to work on projects that may deepen our understanding of the brain function. You have a Master in computer vision, computer graphics, image computing and processing or related fields. You are motivated by working at the interface between **mathematics**, **computer science**, and **neurosciences**. You are problem solver and result-oriented. You have good relational and communication skills with scientists from various disciplines.

Starting date: Spring 2018
Contract duration: internship with possible extension to PhD position (funded)

For more information and to apply, contact stanley.durrleman@inria.fr, nicolas.renier@icm-institute.org, benjamin.charlier@umontpellier.fr,

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