Opening of postdoctoral positions in the IdePHICS lab
"Information, Learning & Physics" with Pr. Florent Krzakala

A significant part of our world is dominated by algorithms that process huge amounts of data, control large infrastructures and take (hopefully) optimal decisions. Yet, the fundamental reasons for their success are becoming increasingly mysterious as the tasks they accomplish become more complex. For instance, neural networks can now drive a car, have a conversation & recognise cats from dog better than humans. Understanding the performance of these machine learning algorithms is among the top research-and-development priorities. The challenging questions we aim to solve are: what are the limit of what we can learn from data, and more importantly, what can we learn *efficiently* with a computer? In our group, we address these questions with an *interdisciplinary approach* that leverage the use of many tools from mathematics, probability, information theory, optimisation & random matrices. We also often use techniques & ideas from theoretical statistical physics. It is the unique synergy between these approaches that make the research in this area exciting! Our group is dynamic, interdisciplinary, highly productive, and among the most represented academic ones in machine learning venues such as NeurIPS, ICML, etc.

We are looking for **two or more candidates with one of the following backgrounds** to join the team:

(1) PhD in *theoretical physics.* Experience in theory of disordered systems (glasses, spin glasses, or interdisciplinary applications) is a plus. We are seeking interest in both analytical (such as replica and cavity method, field theory, etc…) & numerical techniques (message passing, algorithms for sampling, learning and optimisation). Interest in computer science problems and/or machine learning is a must.

(2) PhD in *applied mathematics* such as probability theory, information theory, computer science, statistics or computational mathematics (with a strong interest to learn and use methods from statistical mechanics).

(3) PhD in *machine learning*, with experience in various applications such as data and signal processing, implementation of neural networks, and interest in numerical experiments.

We offer a two-year postdoctoral contract with the Information, Learning and Physics lab (IdePHICS, www.epfl.ch/labs/idephics) led by Prof. Florent Krzakala (florentkrzakala.com). IdePHICS is affiliated with the Institute of Physics in the School of Basic Sciences & with the School of Engineering in EPFL. The fellow will be in contact & invited to collaborate with colleagues and students in physics, computer science, mathematics and engineering. Personal initiative and independent research tasks related with the candidate's interests are also encouraged. The position will **start in 2021** (starting date is flexible).

EPFL (www.epfl.ch) with its main campus located in Lausanne, Switzerland, is a dynamically growing and well-funded institution fostering excellence and diversity. It has a highly international campus with world-class infrastructure. It Is located on the shores of lake Geneva, with a wonderful scenic view on the lake and the alps. As a technical university covering the entire spectrum of science and engineering, EPFL offers a fertile environment for research cooperation between different disciplines. The EPFL environment is multi-lingual and multi-cultural, with English serving as a common interface.
Internationally competitive salaries and benefits are offered.

Interested applicants are invited to send their questions, CV and a statement of motivation and interest in the project to the PI, Prof. Florent Krzakala. Candidates are expected to have read some of my recent publications. Applications are receivable until **November 30, 2020.**

Contact: Prof. Florent Krzakala (florent.krzakala@epfl.ch).