Research period: Position available

The group of D. Holcman (ENS) dedicated to Applied Mathematics and Computational biology offers the following training period at a Master level. Fields covered are stochastic processes, modeling in biology and Big data analysis, image processing and PDEs.

Title: Modeling and Analysis of single particle trajectories of super-resolution images in neurobiology and cellular biology

Project:
- This project concerns the analysis of hundreds of thousands of single stochastic particle trajectories to extract biophysical parameters of live cell organization in collaboration with the group of C. Kaminski (U of Cambridge) and M. Heine (Mainz). Possibility to spend times in Cambridge.

Breaking the optical resolution limit, we have identified potential wells at 100nm from live cell imaging of calcium channels moving in neuronal synapses. Our aim is to develop tools to study various populations of trajectories and to reconstruct the synaptic organization. We shall also estimate the mean escape time from potential wells and synapses, requiring to simulate stochastic trajectories from empirical data or to solve asymptotically linear PDEs.

Duration: at least 6 months.

Refs.
- D Holcman, P Parutto, JE Chambers, M Fantham, LJ Young, SJ Marciniak, ... Single particle trajectories reveal active endoplasmic reticulum luminal flow, Nature cell biology, 1 2018
- Hoze Holcman, PRE 2015.

Candidate: The candidate for this position is expected to be strongly motivated by mathematical and biological sciences. He/she should have a background in applied mathematics. The candidate should be passionate by her/his research. Students are encouraged to write a publication at the end of the training period. We strongly encourage student motivated to continue on a PhD thesis. The group has a strong tradition in training students that are joining top international institutions.

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