

IHP Thematic Program: Random Processes in the Brain: from experimental data to Math and back

November 14, 2022

1st week: February 27 to March 3: Scratch courses

Scratch courses from March 1 to March 3:

- 10:00-12:00: **Neurobiology for mathematicians** by C. Pouzat and C.D. Vargas

Content: Primer on basic neural physiology for mathematicians; von Helmholtz's conjecture of the predictive brain; intrinsic variability of neurobiological data and the need of probabilistic models

- 14:00-16:00: **Stochastics for neurobiologists** by A. Duarte and E. Löcherbach

Content: Stochastic chains: Markov chains and variable length models; a simple model for spiking neurons and statistical inference; modeling EEG data.

Bibliography :

- Galves, A., Löcherbach, E. and Pouzat, C., Probabilistic spiking neuronal nets- Data, Models and Theorems. <https://hal.archives-ouvertes.fr/hal-03196369v1>
 - Hernández, N., Duarte, A., Ost, G., Fraiman, R., Galves, A. and Vargas, C.D., Retrieving the structure of probabilistic sequences of auditory stimuli from EEG data, <https://arxiv.org/abs/2001.11502>.
 - 16:00-18:00: Informal discussions (with coffee and cake) and project proposals / discussions with younger researchers.
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