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## **SEMINAR OF NUMERICAL ANALYSIS**

➤ **WEDNESDAY 18 FEBRUARY 2014 - ROOM CM1 221 - 16h15**

**Prof. Wulfram GERSTNER** (EPFL, Computational Neurosciences Laboratory) will present a seminar entitled :

### **“Mean-field methods for the dynamics of populations of neurons”**

#### **Abstract:**

In order to understand the dynamics in groups of connected neurons we exploit three biological facts:

First, neurons emit short electrical pulses, called action potentials or spikes. These pulses are transmitted to hundreds of other neurons and contribute to excitation of these receiving neurons.

Second, the brain is organized in groups of neurons with similar properties. Third, connectivity between groups of neurons has a stochastic component.

We describe the activity of single neurons by a stochastic point process formulated as a generalized linear model. We then develop a mean-field theory for the activity of groups of similar neurons with random connectivity. We treat finite-size effects and show that the theory predicts simulations to a high degree of accuracy.

*joint work with Tilo Schwalger, Moritz Deger, Richard Naud*

Lausanne, 27 January 2015/MP/cr

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The MATHICSE seminars are announced at <http://mathicse.epfl.ch/seminars>.