*Prof. Marco Picasso*
*Mathematics Institute of Computational Science and Engineering - MATHICSE*

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## *SEMINAR OF NUMERICAL ANALYSIS*

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

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

# "Mean-filed methds for the dynamics of populations of neurons"

**Abstract:**

In order to understand the dynamics in groups of connectedneurons we exploite three biological facts:
First, neurons emit short elecrical pulses, called action potentials or spikes.These pulses are transmitted to hundreds of other neurons and contributeto excitation of these receiving neurons.
Second, the brain is organized in groups of neuronswith similar properties. Third, connectivity between groups of neuronshas a stochastic component.
We describe the activity of single neurons by a stochastic pointprocess formulated as a generalized linear model. We then develop a mean-field theoryfor the activity of groups of similar neuronswith random connectivity. We treat finite-size effects and show that the theorypredicts simulations to a high degree of accuracy.

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

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