LABORATORY OF COMPUTATIONAL NEUROSCIENCE (LCN)

Prof. Wulfram Gerstner
EPFL – IC & SV– LCN
SG –AAB119 (Bâtiment SG-AAB)
Station 15
CH - 1015 LAUSANNE, Switzerland

ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

Tuesday, November 18th, 2014
10h30, Room SV 1717a

Computational Neuroscience Seminar

Yonatan ALJADEFF

Computational Neurobiology Laboratory,
The Salk Institute, California

Dynamics of structured random neural networks

Recently we showed that neural networks with cell-type-specific connectivity statistics exhibit a phase transition between silent and chaotic activity; and that in the chaotic regime these networks can sustain multiple global dynamic modes.

I will present these results and discuss new directions:

1. When the connectivity is defined to obey Dale's law, the dynamics depend explicitly on *N*. Requiring that nothing dramatic happens as *N* grows gives a set of second order balance conditions analogous to the balance of excitation and inhibition.

2. The critical point is derived for a generalized network with a synapse specific gain function *g(i,j)*. Given *g* we predict the network's leading principal components in the space of individual neurons' autocorrelation functions, thereby providing a direct link between the network's structure and some of its functional characteristics.