

LABORATORY OF COMPUTATIONAL NEUROSCIENCE (LCN)

**Thursday, September 24th 2015**

**13h30, Room AAC 008**

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## **Why does the brain need both**

## **pre- and postsynaptic long-term plasticity?**

Although it is well known that long-term synaptic plasticity can be expressed both pre- and postsynaptically, the functional consequences of this arrangement have remained elusive. In this talk I will describe how spike-timing-dependent plasticity with both pre- and postsynaptic expression develops receptive fields with reduced variability and improved discriminability compared to postsynaptic plasticity alone. These long-term modifications in receptive field statistics match recent sensory perception experiments. Moreover, learning with this form of plasticity leaves a hidden postsynaptic memory trace that enables fast relearning of previously stored information, providing a cellular substrate for memory savings. These results reveal essential roles for presynaptic plasticity that are missed when only postsynaptic expression of long-term plasticity is considered, and suggest an experience-dependent distribution of pre- and postsynaptic strength changes.

<http://dx.doi.org/10.7554/eLife.09457>

Host : Prof. Wulfram Gerstner

**Computational Neuroscience Seminar**