



# THE UNIVERSITY OF CHICAGO

Department of Statistics

## SCIENTIFIC AND STATISTICAL COMPUTING SEMINAR

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Neuronal Networks in Sensory Processing

THURSDAY, October 16, 2014 at 4:30 PM  
133 Eckhart Hall, 5734 S. University Avenue  
Host: Nicolas Brunel

### ABSTRACT

In this talk I will discuss some of our modeling efforts involving neuronal networks in visual and olfactory processing. Already the retina performs extensive computations that extract relevant information from the visual signal. This processing is severely impaired if the retina intrinsically generates substantial oscillations as is observed in animal models of diseases involving the degeneration of photoreceptors. We show that these oscillations arise from the bursting of a specific neuron type embedded in the network. In the olfactory system we investigate how the persistent replacement of neurons may allow this system to restructure the network connectivity and thus learn to discriminate very similar odor stimuli. Of particular interest is the fact that this restructuring of the network appears to be controlled by top-down feedback from cortex.

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