

# predictive coding and cortical oscillations workshop

feb. 6-7 2014  
chemin des mines 9  
1202 geneva  
**campus biotech**

## speakers

luc arnal – new-york u., usa  
sophie denève – inserm/ens, france  
bard ermentrout – u. pittsburgh, usa  
lorenzo fontolan – u. geneva, switzerland  
karl Friston – ucl, london, uk  
boris gutkin – inserm/ens, france  
alexandre hyafil – ens, france  
nancy kopell – boston u., usa  
raoul memmesheimer, radboud u., nl  
lars muckli – u. glasgow, uk  
david poeppel – new-york u., usa  
wolf singer – max planck, frankfurt, germany  
miles whittington – u. york, uk  
valentin wyart – inserm/ens, france

*organizers: itsaso olasagasti, lorenzo fontolan, anne-lise giraud*



Kontaktgruppe für Forschungsfragen (KGF)

Merck Serono

NOVARTIS

Roche

EU-BMBWF

syngenta



Société  
Académique



# Program

## Thursday February 6<sup>th</sup>

9.00-9.15 Welcome & introduction:  
Anne-Lise Giraud, Itsaso Olasagasti

9.15-12.30

### **Session 1: Physiology and models of brain oscillations**

Chair: Boris Gutkin/Anne-Lise Giraud

- 9.15 Nancy Kopell  
*Cortical rhythms facilitate bottom-up and top-down processing*
- 10.00 Miles Whittington  
*Sleep rhythms in neocortex: Mechanism of generation and potential for sensory input replay*
- 10.45 Coffee break
- 11.00 Raoul Memmesheimer  
*Nonlinear dendrites, high frequency oscillations and propagation of neural activity*
- 11.45 Boris Gutkin  
*Working with Gamma, Theta and Alpha to Make Working Memory Work*
- 12.30 Lunch break

2.00-6.00

### **Session 2: Oscillations and predictions in the brain**

Chair: Itsaso Olasagasti/Alexandre Hyafil

- 2.00 Luc Arnal  
*Neural sampling constrains on the natural selection of communication signals*
- 2.45 Lars Muckli  
*Layer resolution fMRI to investigate cortical feedback and predictive coding in the visual cortex*
- 3.30 Coffee break
- 3.45 David Poeppel  
*Music, speech, language, and the slow oscillation*
- 4.30 Valentin Wyart  
*Model-based decoding of surprise from MEG signals at successive stages of perceptual decision-making*
- 5.15 Wolf Singer  
*Pattern specific formation of priors by unsupervised learning and replay during resting activity in primary visual cortex*

## Friday February 7<sup>th</sup>

9.00-13.00

### Session 3: Predictive coding and oscillations: a common framework?

Chair: Luc Arnal/David Poeppel

- 9.00 Sophie Denève  
*Predictive coding with spikes and oscillations*
- 9.45 Karl Friston  
*Canonical circuits for predictive coding*
- 10.30 Coffee break
- 10.45 Bard Ermentrout  
*Noise and coding in oscillations*
- 11.30 Lorenzo Fontolan  
*Inference with cortical rhythms in auditory cortex: the role of oscillations and predictive coding.*
- 12.15 Alexandre Hyafil  
*Communication-Through-Coherence or Coherence-Through-Communication?*
- 13.00 End