

CRCNS Conference 2016 Programme

Main meeting

Monday, October 24, 2016

- 08:30 Breakfast and registration
- 09:00 Welcome and introduction
Pierre-Marie Lledo (Institut Pasteur), Michael Matlosz (ANR), Kenneth Whang (NSF)
- 09:30 Keynote lecture: *From evolution to computation*
Gilles Laurent
- 10:30 Info session: *"HBP" at a glance (platforms, ethics): Modeling the brain*
Jean-Pierre Changeux
- 11:00 Coffee break
- 11:30 *Molecular dynamics simulations of protein interactions leading to synaptic vesicle fusion*
Maria Bykhovskaia
- 11:45 *Uncovering representations of sleep-associated hippocampal ensemble spike activity*
Zhe (Sage) Chen
- 12:00 *Exploring the neurophysiological basics of brain connectivity using multimodal imaging*
Hans Wehrl
- 12:15 *NREM sleep improves learning and protects memories from interference*
Maxim Bazhenov
- 12:30 *Reconstruction and computational modeling of the mammalian spinal locomotor circuits*
Ilya Rybak
- 12:45 *Neural basis of semantic representations during language processing*
Tom Mitchell
- 13:00 Poster session I
Lunch break
- 15:00 *A calcium-based model of spike-timing dependent plasticity*
Gaetan Vignoud
- 15:15 *Brain-computer interfaces for basic science*
Byron Yu
- 15:30 *DataLad - decentralized data distribution for consumption and sharing of scientific datasets*
Yaroslav O. Halchenko

- 15:45 *Keeping track of complex data: Benefits of comprehensive data management for efficient data access, reproducibility, and sharing*
Thomas Wachtler
- 16:00 Info session: *The "Bernstein Network" at a glance*
Andreas V. M. Herz
- 16:15 Info session: *"BRAIN Initiative" at a glance*
James W. Gnad
- 16:30 Coffee break
- 17:00 *Cerebellar learning using perturbations*
Boris Barbour
- 17:15 *The emergence of distributed functional networks in the early developing cortex*
Matthias Kaschube
- 17:30 *Optimally controlling the human connectome*
Richard Betzel
- 17:45 *Odor Identity Coding*
Dmitry Rinberg, Alexei Koulakov
- 18:05 Poster session II
Reception
- 20:00 End of day 1

Tuesday, October 25, 2016

- 08:30 Breakfast and registration
- 09:00 *Decoding the population activity of grid cells for spatial localization and goal-directed navigation*
Andreas V. M. Herz
- 09:15 *A bi-exponential model for cerebral perfusion imaging using IVIM*
Luisa Ciobanu
- 09:30 *Multiscale study of reliability and correlation of evoked cortical dynamics during natural scene processing in cat V1*
Cyril Monier
- 09:45 *Brain response pattern induced by economic inequity predicts present and future depression index*
Masahiko Haruno
- 10:00 Info session: *Funding opportunities*
Kenneth Whang (NSF), Andrew Rossi (NIH), Sheyla Mejia-Gervacio (ANR), Yair Rotstein (BSF)

- 10:30 Coffee break
- 11:00 Keynote lecture: *Conscious and unconscious AI*
Hughes Bersini
- 12:00 *Geometry learning for neuronal data analysis*
Ron Meir
- 12:15 *Persistent structural plasticity and top-down control in the olfactory system*
Kurt A. Sailor, Hermann Riecke
- 12:35 Lunch break
- 13:30 Keynote lecture: *Excitation-inhibition balance in cortical circuits: New challenges and insights*
Haim Sompolinsky
- 14:30 *A model for VTA circuitry: Toolbox for the study of addictions*
Alexey Kuznetsov
- 14:45 *Neural mechanisms of decision-making: From value-encoding to preference formation and reversals*
Marius Usher
- 15:05 Coffee break
- 15:30 *Quantifying thermal escape response in caenorhabditis elegans*
William Ryu
- 15:45 *Predicting unequal treatment: The role of social perception in economic valuation*
Ming Hsu
- 16:00 *How odor representations are sparsened in olfactory cortex: Experiments and modeling*
Kevin M. Franks
- 16:15 *Selectivity from random networks*
Nicholas Priebe
- 16:30 *Functional reorganization in early sensory areas during category learning*
Robert Kozma
- 16:45 *The striatal cholinergic system and beta oscillations: Implications for Parkinson's disease*
Michelle McCarthy
- 17:00 Transfer to NeuroSpin facility
- 18:00 Visit of NeuroSpin
Reception
- 20:30 End of day 2, end of main meeting

Workshop

Wednesday, October 26, 2016

- 08:30 Breakfast and registration
- 09:00 Keynote lecture: *Combining models and experiments, from single cells to network dynamics*
Alain Destexhe
- 10:00 Working group sessions
- Working group 1: *Combining macro and micro neuroimaging approaches*
Luisa Ciobanu, Denis Le Bihan, Hans Wehrl, Guy Courbebaisse
- Working group 2: *From artificial intelligence to neuroscience, and Back*
Boris Gutkin, Mehdi Khamassi, Samuel Gershman, Haim Sompolinsky, Sophie Deneve, Ron Meir
- Working group 3: *High dimensional neural coding*
Peter F. Dominey, Omri Barak, Alberto Bernacchia, Anand Subramoney
- 11:00 Coffee break
- 11:30 Working group sessions
- Working group 1: *Combining macro and micro neuroimaging approaches*
Luisa Ciobanu, Denis Le Bihan, Hans Wehrl, Guy Courbebaisse
- Working group 2: *From artificial intelligence to neuroscience, and Back*
Boris Gutkin, Mehdi Khamassi, Samuel Gershman, Haim Sompolinsky, Sophie Deneve, Ron Meir
- Working group 3: *High dimensional neural coding*
Peter F. Dominey, Omri Barak, Alberto Bernacchia, Anand Subramoney
- 13:00 Lunch break
- 14:00 Report on working groups
- 15:00 Closing remarks
Kenneth Whang (NSF), Daria Julkowska (ANR), Pierre-Marie Lledo (Institut Pasteur)
- 15:30 End of day 3, end of workshop, end of conference

Poster session I: Monday, October 24 2016, 13:00 – 15:00

- Demo *DataLad - decentralized data distribution for consumption and sharing of scientific datasets* - Yaroslav O. Halchenko, Michael Hanke
- 1 *Atomistic-level investigation of odor perception* - Xiaojing Cong, Jérôme Golebiowski
- 2 *Calcium dynamics predict direction of synaptic plasticity in striatal spiny projection neurons* - Joanna Jedrzejewska-Szmek
- 3 *Dendritic diameter influences the rate and magnitude of hippocampal cAMP and PKA transients during Beta-AR activation* - Vincent Luczak
- 4 *Neuromuscular junction transmitter release sites: Structure-function relationships, neuromuscular disease, and treatment strategy* - Stephen Meriney, Christopher Meriney, Rozita Laghaei
- 5 *Endocannabinoid dynamics gate spike-timing dependent depression and potentiation* - Ilya Prokin
- 6 *Computations in cerebellar microcircuits enabled by dynamical synapses* - Alessandro Barri
- 7 *Dopamine-endocannabinoid interactions mediate spike-timing dependent potentiation in the striatum* - Laurent Venance
- 8 *Neural scaling laws for an uncertain world* - Marc Howard
- 9 *Dynamic functional network analysis during human seizures* - Louis-Emmanuel Martinet
- 10 *Hippocampal firing dynamics across sleep and wake states* - Kamran Diba
- 11 *Neurobehavioral assessment of a computational model of reward learning* - Alain R. Marchand, Mehdi Khamassi
- 12 *Dissecting neural circuits for acute pain* - Zhe (Sage) Chen
- 13 *Cortical mechanisms for enhanced aversive responses in the chronic pain condition* - Jing Wang
- 14 *Estimating fiber orientation distribution from diffusion MRI with spherical needlets* - Jie Peng
- 15 *Network optimization theory identifies core essential nodes in LTP-induced brain networks* - Hernan Makse
- 16 *Neural correlates of human auditory perceptual switching* - Rodica Curtu, Bingni W. Brunton
- 17 *Opposing spatial profiles of inhibition correlate with asymmetric neural activity in olfactory cortex during novel exploration* - Anne-Marie Oswald
- 18 *Extracellular field potential in the nucleus laminaris of the barn owl is mainly shaped by the local activity of afferent axons* - Paula Kuokkanen, Thomas McColgan
- 19 *Extracellular field potentials of axon fiber bundles* - Thomas McColgan, Paula Kuokkanen
- 20 *Coding of visuomotor information in the parietal cortex* - Stefan Glasauer
- 21 *The emergence of distributed functional networks in the early developing cortex* - Bettina Hein
- 22 *Model-based identification of ganglion cell subunits in primate retina* - E.J. Chichilnisky
- 23 *Neural blackboard architecture simulation captures the behavior of diverse neuroimaging measurements of language processing* - Martin Perez-Guevara, Christophe Pallier

- 24 *The hippocampus as a predictive map* - Kimberly L. Stachenfeld
25 *Attentional deployment during multi-attribute decision making* - Ernst Niebur, Veit Stuphorn
26 *History-dependent muscle spindle spike rates encode muscle stretch-force information* - Kyle Blum
27 *Stochastic dynamic operator application to analysis of spinal cord neural recordings* - Simon Giszter
28 *The role of the pallidostriatal circuit in parkinsonian oscillations* - Jonathan Rubin
29 *Versatile format and tools for comprehensive data organization in neuroscience* - Thomas Wachtler
30 *OPTISTIM – Combining computational neuroscience with human and ovine electrophysiology for optimizing cortical stimulation* - C. Alexis Gkogkidis
31 *Dendrites enable a robust mechanism for neuronal stimulus selectivity* - Romain Cazé
32 *An IC-based controllable stimulator for in vivo experiments* - Jonathan Castelli, Sylvie Renaud, Yannick Bornat
33 *Singularities in visual cortex, and some thoughts on topological principles and perceptual impact* - Jonathan Touboul
34 *Monte Carlo simulations predict differences in nanoscale topography of calcium channels and synaptic vesicles contribute to functional synaptic diversity* - Maria Reva
35 *Brain response pattern induced by economic inequity predicts present and future depression index* - Masahiko Haruno
36 *Correlations in binary networks with time-dependent input* - Tobias Kühn
37 *Odor coding in cortical neural networks* - Alexander Fleischmann
38 *Modeling the human brain under natural vision* - Shinji Nishimoto
39 *Multiplexing computations in the retina* - Olivier Marre
40 *Perceptual decisions biased by the cost to act* - Nobuhiro Hagura

Poster session II: Monday, October 24 2016, 18:00 – 20:00

- 41 *Cerebellar learning using perturbations* - Boris Barbour
42 *Spike-timing dependent plasticity (STDP) rules in physiological extracellular calcium* - Yanis Inglebert
43 *Design and implementation of multi-signal, time-lapse digital reconstructions of neuronal morphology* - Giorgio Ascoli
44 *Computation-enabled ventilatory control system (CENAVEX)* - Ranu Jung, Sylvie Renaud
45 *A calcium-based model of spike-timing dependent plasticity* - Gaetan Vignoud, Jonathan Touboul, Laurent Venance
46 *Molecular dynamics simulations of protein interactions leading to synaptic vesicle fusion* - Maria Bykhovskaia
47 *PKMzeta and compensatory PKC isoforms for maintaining LTP and memory* - Todd Sacktor
48 *Self-organization accounts for cortical synaptic dynamics* - Daniel Miner
49 *Quantitation of the inhibitory restraint: The second year* - Andrew Sornborger

50 *Comparative ultrastructural anatomy of dendritic spines* - Dinu Patirniche
51 *Ultra-structural simulations of electro-chemical signals through dendritic spines* - Gillian
Queisser
52 *Prefrontal cortex reservoir network learns novel efficient navigation sequences by
concatenating replayed place-cell snippets* - Nicolas Cazin, Peter F. Dominey
53 *Inference of connectivity from extracellular data* - Asohan Amarasingham
54 *Fast and accurate spike sorting in vitro and in vivo for up to thousands of electrodes* -
Pierre Yger
55 *Connectivity hyperalignment: A common model of representation and connectivity in the
human brain* - James V. Haxby
56 *Exploring the neurophysiological basics of brain connectivity using multimodal imaging* -
Hans Wehrl
57 *US-French collaboration: Integrating MEG/EEG, computational modeling, and intracranial
recordings to reveal mechanisms and functions* - Stephanie Jones, Alexandre Gramfort
58 *Automated rejection and repair of bad trial in MEG/EEG* - Mainak Jas
59 *M/EEG source localization with multi-scale time-frequency dictionaries* - Yousra Bekhti
60 *Searchlight factor models in multi-subject fMRI analysis* - Hejia Zhang
61 *Top-down control of network evolution and stimulus discrimination in olfaction* - Hermann
Riecke
62 *Continuous synaptic turnover in the olfactory bulb optimizes odor processing* - Kurt A.
Sailor
63 *Concentration invariant odor identity coding* - Dmitry Rinberg
64 *Neural relativity principle* - Alexei Koulakov
65 *The birdbrain reveals the relevant neural representations of communication signals in the
auditory cortex* - Julie E. Elie, Hédi A. Soula
66 *Go with the flow - Flow sensing with passive whiskers* - Venkatesh Gopal
67 *How odor representations are sparsened in olfactory cortex: experiments and modeling* -
Kevin M. Franks
68 *Prestimulus high gamma oscillations in the sensorimotor cortex predict response speed to
visuotactile stimuli* - Daniel Senkowski
69 *Perisaccadic updating of spatial attention: A neuro-computational study* - Fred Hamker
70 *Adaptation modulates correlated response variability in visual cortex* - Ralf Wessel
71 *The speed of continuous face detection* - Jacob G. Martin
72 *Multiscale study of reliability and correlation of evoked cortical dynamics during natural
scene processing in cat V1* - Yannick Passarelli, Cyril Monier
73 *A model constrained by visual hierarchy to study contextual modulation in primary visual
cortex* - Margot Larroche, Jan Antolik
74 *Computational and neural mechanisms of memory guided decisions* – Raphael T. Gerraty,
Daphna Shohamy, Nathaniel Daw
75 *Spatiotemporal factors in audiovisual rate-discrimination* - Shannon Locke
76 *Semantic representations of language and vision revealed by fMRI with natural stimuli* -
Alexander Huth

- 77 *Dopamine blockade affects exploration and learning rate in a non-stationary 3-armed bandit task* - François Cinotti, Mehdi Khamassi
- 78 *Synchrony and Entrainment: The yin and yang of the mammalian circadian clock* - Bharath Ananthasubramaniam
- 79 *Identification of VIP SCN firing patterns that phase shift and entrain circadian rhythms* - Cristina Mazuski
- 80 *Kölliker-Fuse orchestrates timing of abdominal nerve bursting* - Daniel Zoccal
- 81 *Multiscale modeling of subcallosal cingulate local field potentials in deep brain stimulation for depression* - Vineet Tiruvadi
- 82 *Gait transitions in a phase model of CPGs* - Philip Holmes
- 83 *A continuous model of the rod photoreceptor: Towards a functional study of the retinal first logical layer* – Etienne B. Roesch