

DAY 1 Monday March 10, 2014

- 8:30 – 9:30 Registration
9:30 – 9:45 Opening of the School and Welcome Speech (S. Vassanelli, University of Padova)

NANO- AND MICRO-ELECTRODES FOR NEURAL INTERFACES 'IN VITRO'

- 9:45 – 11:15 **Recording and stimulation of neurons by capacitive and faradaic microelectrodes**
S. Vassanelli, University of Padova
- 11:15 – 11:30 *Coffee break*
- 11:30 – 13:00 **Microelectronic Platforms for In-Vitro and In-Vivo Recording and Stimulation of Neural Tissue - Technical and Engineering Challenges –**
R. Thewes, University of Berlin
- 13:00 – 14:30 *Lunch*
- 14:30 – 16:00 **Nanotools for Neuroscience: networks of neurons and nano materials**
L. Ballerini, SISSA – Trieste

PRACTICAL SESSION

- 16:00 – 18:30 **In vivo recording with conventional and multi-site electrodes**
16:00 – 18:30 **Signal processing software for neuronal signals (by M. Mahmud, University of Antwerp)**

DAY 2 Tuesday March 11, 2014

MULTI ELECTRODE APPROACHES FOR 'IN VITRO' RECORDING

- 8:30 – 10:00 **Microelectronic approaches and micro-/nano technologies for large-scale high-resolution electrophysiological measures in brain circuits**
L. Berdondini, Italian Institute of Technology (IIT) - Genova
- 10:00 – 11:15 **High-resolution large-scale recording with CMOS multi-transistor array (MTA)**
R. Zeitler, Max-Planck Institute for Intelligent Systems - Stuttgart
- 11:15 – 11:30 *Coffee break*
- 11:30 – 13:00 **Bio-artificial networks and hybrid systems to investigate neuronal dynamics and information processing in the brain**
S. Martinoia, University of Genova
- 13:00 – 14:30 *Lunch*
- 14:30 – 15:30 **Insights into primary neurons and neuronal cell lines culture methods**
M. Maschietto, University of Padova

PRACTICAL SESSION

- 15:30 – 19:00 **Neural networks recording with MEA / MTA and patch clamp recording *in vitro***

DAY 3 Wednesday March 12, 2014

RECORDING NEURAL CIRCUITS 'IN VIVO' BY MULTI-ELECTRODE APPROACHES: TECHNOLOGIES AND TRANSLATIONAL STUDIES

- 8:30 – 10:00 **Implantable neural probes for large-scale high-resolution recording *in vivo***
S. Vassanelli
- 10:00 – 11:30 **Conventional and novel technologies for dissecting cognitive functions in primates**
S. Ferraina, University 'La Sapienza' - Rome
- 11:30 – 11:45 *Coffee Break*
- 11:45 – 13:15 **Translational studies in mice to unravel the Genetics of higher order cognitive functions**
F. Papaleo, University of Padova and IIT
- 13:15 – 14:30 *Lunch*
- 14:30 – 16:00 **Neuroelectronic chip-retina interface - translating concepts to neuroprosthetic implants**
G. Zeck, NMI - Reutlingen
- 16:00 – 18:00 **Closed-loop electrophysiology and the investigation of neuronal networks**
M. Giugliano, University of Antwerp
- 18:00 – 19:00 *Get together and free discussion with the speakers*

DAY 4 Thursday March 13, 2014

LIGHT-BASED ELECTROPHYSIOLOGY

- 8:30 – 10:00 **Investigating cell excitability by calcium imaging methods**
M. Mongillo, Venetian Institute for Molecular Medicine (VIMM) - Padova
- 10:00 – 11:30 **Voltage sensitive dye (VSD) recording of neuronal networks**
J. Mapelli, University of Modena
- 11:15 – 11:30 *Coffee Break*
- 11:30 – 13:00 **Microbial rhodopsins: Structure, Mechanism and Application**
M. Prigge, Weizmann Institute of Science - Rehovot
- 13:00 – 14:30 *Lunch*
- 14:30 – 16:30 **Investigating the neuronal code: from information theory to the analysis of neuronal population signals**
S. Panzeri, IIT - Rovereto
- PRACTICAL SESSION**
- 16:30 – 18:30 **Calcium imaging methods (Marta Giacomello, University of Padova)**
- 16:30 – 18:30 **Demonstrations of calcium and VSD imaging of excitable cells**
- 19:30 *Dinner (Restaurant in Padua's historic center)*

DAY 5 Friday March 14, 2014

INVESTIGATING BRAIN CIRCUITS

8:30 – 11:15 **Poster session**

11:15 – 11:30 *Coffee Break*

11:30 – 13:00 **Mapping the connectional architecture of the rodent brain with fMRI**
Gozzi, IIT - Rovereto

13:00 – 13:30 *Lunch*

13:30 – 15:00 **Computing and learning in the cerebellar network: a multi-level modeling and experimental approach**
E. D'Angelo, University of Pavia and Mondino Institute - Pavia

15:00 – 16:30 **Bridging theory of neural populations and neuromorphic implementations: concepts and experiences**
P. Del Giudice, Istituto Superiore di Sanità - Rome

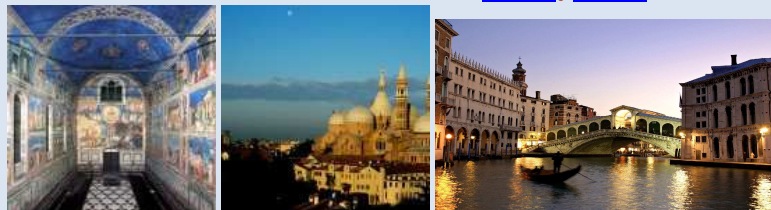
PRACTICAL SESSION

16:30 – 18:30 **Optogenetic stimulation of neurons *in vitro***

18:30 Concluding remarks and final discussion
S. Vassanelli

DAY 6 Saturday March 15, 2014

*VISIT TO HISTORIC ATTRACTIONS OF **PADUA** / **VENICE****



**Program and fee details will be made available in short.*

*Attendees willing to join the tour should select the 'Visit of **PADUA**/**VENICE**' option in the online registration form.*