



## XXIV School of Physiology and Biophysics 2021

### *NEURONAL BIOPHYSICS: FROM EXPERIMENTS TO MODELS*

Pavia, July 5-7, 2021

Aula Grande, Fisiologia Generale, Via Forlanini 6

**Organizer: prof Egidio D'Angelo**

**Scientific committee:**

Egidio D'Angelo, Gerardo Biella, Francesco Moccia, Mauro Toselli, Francesca Prestori, Lisa Mapelli, Claudia Casellato, Fulvia Palesi, Sergio Masetto, Giancarlo Russo, Paola Perin.

**Technical assistance:**

Simona Tritto, Stefano Masoli

**Supported by:**

Department of Brain and Behavioral Sciences (University of Pavia)

Department of Biology and Biotechnology (University of Pavia)

Center of Health and Technology (University of Pavia)

Human Brain Project – EBRAINS (EU)

### **DAY 1 - Principles of neuronal physiology and biophysics**

**9.00-10.00    Opening Lecture.**

*The data - models handshake: from data to models and back.* (Egidio D'Angelo)

**10.00-10.15    coffee break**

10.15-11.15 The biophysics of membranes and neurons (Egidio D'Angelo)

11.15-12.15 Ionic channel gating, localization and regulation (Mauro Toselli)

**12.15-14.00    lunch break**



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14.00-15.00 Principles of dendritic and axonal functions (Stefano Masoli)  
15.00-15.45 Principles of synaptic transmission and plasticity (Gerardo Biella)  
15.45-16.30 Multiple forms of plasticity in neuronal microcircuits (Francesca Prestori)

### **21.00 Casella Prize: *lectio magistralis*, Almo Collegio Borromeo**

Prof. Michael Hausser, University College London, "Forging causal links between neural circuit activity and behavior"

## **DAY 2 - Advanced techniques for neuronal recording and stimulation**

### **9.00-10.00 Featured Lecture**

*Photostimulation of Neurons* (Fabio Benfenati, University of Genova)

### **10.00-10.15 coffee break**

10.15-11.15 Patch-clamp (Sergio Masetto, Teresa Soda)

11.15-12.15 Imaging and 2-PM (Francesco Moccia, Marialuisa Tognolina)

### **12.15-14.00 lunch break**

14.00-15.00 Optical and electrophysiological techniques in vivo (Lisa Mapelli, Ileana Montagna)

### **15.00-15.15 coffee break**

### **15.15 – 17.00 VISIT TO LABORATORIES**

Optogenetics and optical recordings in vitro (Eleonora Pali)

Optogenetics and optical recordings in vivo (Ileana Montagna)

MEA recordings in vitro (Alessandra Ottaviani)

MEA recordings in vivo (Danila Di Domenico)

Patch-clamp recordings in vitro (Teresa Sorbo, Francesca Talpo, Francesca Raffin, Teresa Soda, Roberta Giunta)

Calcium imaging in vitro (Francesco Moccia, Pawan Faris, Sharon Negri)

2-photon microscopy in vitro (Marialuisa Tognolina)

### **20.30 Social dinner:**

### **Prime Aiture, Casteggio (PV)**



## DAY 3 - Neural computation

### 9.00-10.00    **Featured Lecture**

*Cognitive functions and dysfunctions emerging from large-scale brain models* (Michele Migliore, CNR)

### 10.00-10.15    **coffee break**

10.15-11.15 Subcellular and cellular models (Stefano Masoli, Martina Rizza, Thierry Nieus)

11.15-12.15 Microcircuit models (Claudia Casellato, Alice Geminiani)

### 12.15-14.00    **lunch break**

14.00-15.00    Whole-brain models (Fulvia Palesi, Alice Geminiani)

### 15.00-15.15    **coffee break**

### 15.00 – 17.00 VISIT TO LABORATORIES

Single Neuron Models (Martina Rizza, Stefano Masoli)

Microcircuit Models (Robin De Schepper, Alice Geminiani)

Large-scale models (Anita Monteverdi, Marta Gaviraghi, Fulvia Palesi)

### 17.00 – 18.00 CONCLUSIONS AND FAIRWELL

