**Con il patrocinio di:**

Consiglio Nazionale delle Ricerche

SINC Società Italiana di Neurofisiologia Clinica

GNB Gruppo Nazionale di Bioingegneria (GNB)

LICE

Sin Società Italiana di Neurologia

Fondazione NEUROMED Prevenzione • Formazione • Divulgazione

I.E.ME.S.T. Istituto Euro-Mediterraneo di Scienza e Tecnologia

FONDAZIONE NEURONE onlus

Viale Regina Margherita, 169
00198 Roma, ITALY
Tel: (+39)06 8841033
Email: info@fondazioneneurone.it
Web: www.fondazioneneurone.it

NEUROBIOTECH Polo di Ricerca e Innovazione
Research & Innovation in Neuroscience and Biotechnology

NEUROMED I.R.C.C.S. Istituto Neurologico Mediterraneo

Università degli Studi di Napoli Federico II

Wadsworth Center
New York State Department of Health

**Sponsor:**

g.tec Guger Technologies

a circle habilitation concept

motek medical improving human performance

BancaEtruria

Segreteria organizzativa

MORE Comunicazione Eventi & More
Via Monte Zebio, 9
00195, Roma
Tel. +39 06 89011781
Fax +39 06 94443440
info@morecomunicazione.it
morecomunicazione.it

cyber brain Polo d'Innovazione

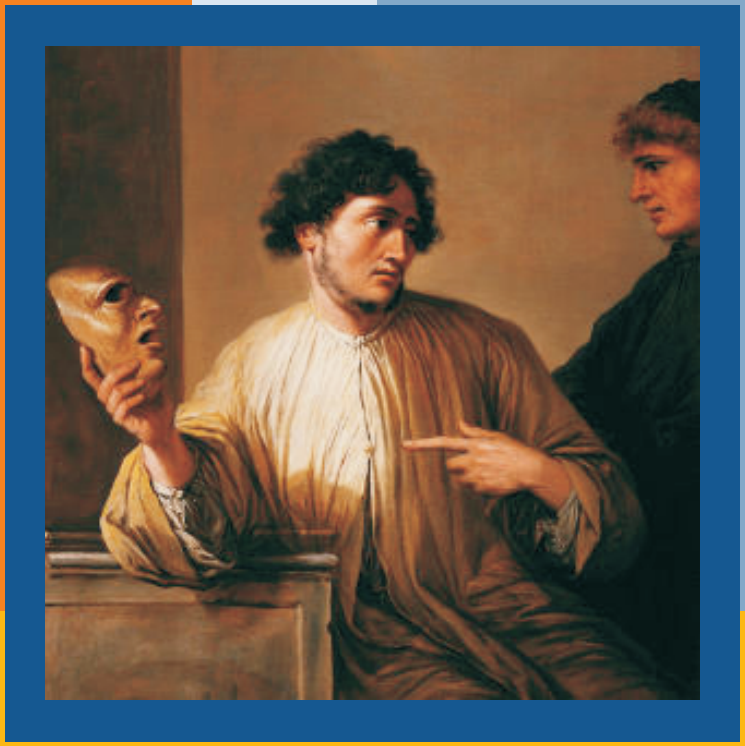
Ministero dell'Istruzione, dell'Università e della Ricerca

Ministero dello Sviluppo Economico

PON Ricerca e Competitività 2007-2013

UNIONE EUROPEA Fondo Europeo di Sviluppo Regionale

## International Workshop



# NEW FRONTIERS IN NEUROTECHNOLOGY

***Clinical and experimental realms***

**September 12 - 13, 2014**
**Naples, Italy**

Complesso dei SS. Marcellino e Festo
Largo S. Marcellino, 10

## Scientific Committee

**Gerwin Schalk, PhD**
Research Scientist
Division of Translational Medicine
Wadsworth Center
Associate Professor
Department of Neurology
Albany Medical College

**Anthony Ritaccio, MD, FAAN, FANA**
Professor of Neurology and Neurosurgery
Department of Neurology
Albany Medical Center
Albany, New York, USA

**Febo Cincotti, PhD**
Research Scientist
Neuroelectrical Imaging and BCI Laboratory
Fondazione Santa Lucia IRCCS, Rome, Italy
Department of Computer, Automatic and Management Engineering
Sapienza University of Rome, Italy

**Donatella Mattia, PhD**
Research Scientist
Neuroelectrical Imaging and BCI Laboratory
Fondazione Santa Lucia IRCCS, Rome, Italy

## Workshop Organization

**Giulio Nicolò Meldolesi, MD**
Fondazione Neurone, Rome, Italy

**Fabio Sebastiano, PhD**
Neuromed IRCCS, Pozzilli (IS), Italy

**Antonio Sparano, MD**
Neuromed IRCCS, Pozzilli (IS), Italy

**Giancarlo Di Gennaro, MD**
Neuromed IRCCS, Pozzilli (IS), Italy

## Faculty

**Giuliano Avanzini**
Department of Neurophysiology and Epilepsy Unit
Fondazione IRCCS Istituto Neurologico Carlo Besta, Milan, Italy

**Gerwin Schalk, PhD**
Research Scientist
Division of Translational Medicine
Wadsworth Center
Associate Professor
Department of Neurology
Albany Medical College
Albany, New York, USA

**Peter Brunner, PhD**
Assistant Professor
Department of Neurology
Albany Medical College
Albany, New York, USA

**Luciano Fadiga, MD**
Professor of Human Physiology
University of Ferrara, Italy

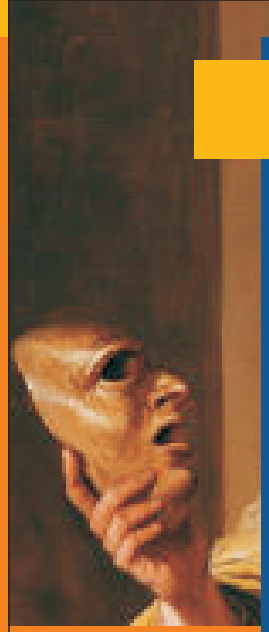
**Robert T. Knight, MD**
Professor of Psychology and Neuroscience
UC Berkeley
Berkeley, CA, USA

**Angela Riccio, PhD**
Neuroelectrical Imaging and BCI Laboratory
Fondazione Santa Lucia IRCCS, Rome, Italy
Sapienza University of Rome, Italy

**Claudia Sannelli, PhD**
Research Associate
Department of Software Engineering and Theoretical Computer Science
Technical University, Berlin, Germany

**Francesca Schettini, PhD**
Neuroelectrical Imaging and BCI Laboratory
Fondazione Santa Lucia IRCCS, Rome, Italy
Department of Computer Science and Systems
Sapienza University of Rome, Italy

**Alessandro Vato, PhD**
Researcher
Center for Neuroscience and Cognitive Systems
Fondazione Istituto Italiano di Tecnologia, Rovereto, Italy



# NEW FRONTIERS IN NEUROTECHNOLOGY

## *Clinical and experimental realms*

Neurotechnology is poised to become one of the most exciting new areas of the 21st century.

Neurotechnologies integrate advanced methods in electrical engineering and computer science with current understanding in neuroscience and neurophysiology to produce new devices that can diagnose, cure or alleviate disorders of the nervous system.

Current work in this area centers on development of new devices that can interact with the nervous system, on new mathematical or software techniques that enable or facilitate this interaction, and on achieving a refined understanding of the physiological basis of normal and abnormal function.

This work is making great strides toward the design and implementation of a new generation of devices that can:

1) restore or augment sensory function (e.g., cochlear or retinal implants) or motor function (e.g., brain-computer interfaces for people with severe paralysis or neurorehabilitation for people with stroke);

2) diagnose normal or abnormal brain function (e.g., real-time functional brain mapping); or

3) cure or alleviate symptoms of disease (e.g., deep brain stimulation to treat tremor in patients with Parkinson's disease).

This two-day workshop highlights scientific, engineering, and clinical aspects of this exciting new area.

It is presented by leading experts from the United States of America, Germany, and Italy, and features theoretical lectures as well as practical tutorials with brain-computer interfaces that allow people to control devices using brain signals.

The purpose of this workshop is to bring together experts in this emerging field, and to communicate the exciting prospects of this area.

## Friday, September 12, 2014

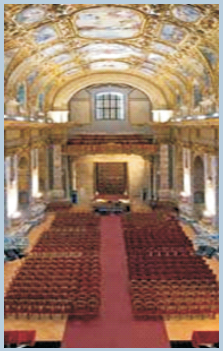
| | |
|---|---|
| 08:30a - 08:50a | **Ceremonial speakers** |
| 08:50a - 09:00a | **Keynote introduction**<br>Gerwin Schalk<br>*Wadsworth Center, Albany, New York, USA* |
| 09:00a - 9:45a | **Insights into human cognition from electrocorticography**<br>Robert Knight<br>*University of California, Berkeley, USA* |
| 10:00a - 10:45a | **Functional brain mapping: from active to passive**<br>Anthony Ritaccio<br>*Albany Medical College, Albany, New York, USA* |
| 11:00a - 11:45a | **Interfacing sensorimotor brains**<br>Luciano Fadiga<br>*University of Ferrara, Italy* |
| 12:00p - 12:45p | **Bidirectional brain-computer interfaces**<br>Alessandro Vato<br>*Fondazione Istituto Italiano di Tecnologia, Rovereto, Italy* |
| 01:00p - 02:00p | Lunch |
| 02:00p - 02:45p | **Physiological basis for brain-computer interactions**<br>Febo Cincotti<br>*University of Rome, Italy* |
| 03:00p - 03:45p | **Technical basis of brain-computer interactions**<br>Peter Brunner<br>*Wadsworth Center, Albany, New York, USA* |
| 04:00p - 04:45p | **Clinical demands for brain-computer interactions**<br>Donatella Mattia<br>*Fondazione Santa Lucia, Rome, Italy* |
| 05:00p - 05:45p | **Presentation of demo stations**<br>(robotic arm, BCI2000 demo station, neurorehab, etc.) |

## Saturday, September 13, 2014

| | |
|---|---|
| 08:50a - 09:00a | **Keynote introduction**<br>Anthony Ritaccio<br>*Albany Medical College, Albany, New York, USA* |
| 09:00a - 09:45a | **Keynote address**<br>Giuliano Avanzini<br>*IRCCS Istituto Neurologico Carlo Besta, Milan, Italy* |
| 10:00a - 10:45a | **Opportunities of merging brains with machines**<br>Gerwin Schalk<br>*Wadsworth Center, Albany, New York, USA* |
| 11:00a - 11:45p | **The inefficiency problem for motor-imagery brain-computer interfaces**<br>Claudia Sannelli<br>*Technical University of Berlin, Germany* |
| 12:00p - 01:00p | Lunch |
| 01:00p - 02:00p | **Poster session, poster award** |
| 02:00p - 02:30p | **Practical tutorial on brain signal recording techniques**<br>Angela Riccio<br>*University of Rome, Italy* |
| 02:30p - 05:30p | **Practical sessions**<br>These practical sessions allow participants to control a computer using brain signals alone<br>Francesca Schettini<br>*University of Rome, Italy* |
| 05:30p | **Social event** |

## Congress Venue

### CONGRESS CENTER FEDERICO II



The Congress Centre of the University of Naples Federico II arises from the increasing demand on the part of individuals inside and outside the University, to use some historic venues for the organization of events. Important structures such as the complex of SS. Marcellino e Festo, thanks to significant restoration works, have been recovered to their former glory.

The Church of the Monastery of Saints Marcellino and Festo is the most valuable part of the great convent, awarded in 1907 at the University of Naples and now completely restored.

Today, the structure consists of a hall with 160 seats.

**Location:**
**largo S. Marcellino, 10**
**Naples**


## HOTEL

**Costantinopoli 104**
Via Santa Maria di Costantinopoli, 104
*Walking distance to the Congress Venue (900mt)*

**Hotel Piazza Bellini**
Via Santa Maria di Costantinopoli 101
*Walking distance to the Congress Venue (900mt)*

## SURROUNDING...

### San Severo Chapel

The Sansevero Chapel Museum in the historic heart of Naples is a jewel of the world's artistic heritage. Here, baroque creativity, dynastic pride, beauty and mystery blend to create a unique and almost timeless atmosphere.

### Santa Chiara Complex

Set in the historical centre of Naples, near via Santa Chiara, in the area of Piazza del Gesu' and close to San Domenico Maggiore, the Complex is inside the Franciscan citadel and includes the Museum, the Archaelogical Area, the Majolica-tiled Cloister, and the collection of Nativity Scenes (also known as Christmas Cribs) from the 1700s.

### Naples Underground

Forty meters below the characteristic and lively streets of the Historic Center of Naples, you find a different world, unexplored, isolated by time, but deeply connected with the world above. It's the heart of Naples, and the place from which the city was born. To visit it is to travel to the past, a world 2400 years old.

### San Gregorio Armeno

Via San Gregorio Armeno is the famous street of the artisans of the nativity scene, famous throughout the world for its numerous craft dedicated to the art nativity. The street and shops can be visited throughout the year and so the visitor is led back each time to the magical Christmas atmosphere.