



«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE
TO PAY A PERMANENT TRIBUTE TO ARCHIMEDES AND GALILEO GALILEI, FOUNDERS OF MODERN SCIENCE
AND TO ENRICO FERMI, THE "ITALIAN NAVIGATOR", FATHER OF THE WEAK FORCES



INTERNATIONAL SCHOOL OF BRAIN CELLS AND CIRCUITS «CAMILLO GOLGI»

1st Course: *MODELING THE BRAIN: FROM NEURONS TO INTEGRATED SYSTEMS*

ERICE-SICILY: 29 NOVEMBER – 3 DECEMBER 2015

Sponsored by the: · Italian Ministry of Education, University and Scientific Research · Sicilian Regional Government · Centro Fermi ·
· CNR · Fondazione Istituto Neurologico Nazionale C. Mondino · University College London · Siemens Healthcare

PROGRAMME AND LECTURERS

Biophysically detailed models of neurons and networks

Stochastic effects in neurons at molecular and cellular levels

- E. DeSCHUTTER, OIST, Okinawa, JP

Complex dynamics in single neuron and microcircuit models

- E.U. D'ANGELO, University of Pavia, IT

Reconstruction and simulation of cortical microcircuitry

- E. MULLER, EPFL, Lausanne, CH

Modeling in Python-NEURON

- M. HINES, Yale University, New Haven, CT, US

Large-scale models and theory

Odor perception through network self-organization: large-scale modeling of the olfactory bulb

- M. MIGLIORE, CNR, Palermo, IT

Parallel Network Modeling with NEURON

- M. HINES, Yale University, New Haven, CT, US

Realistic mean-field models of neuronal populations

- A. DESTEXHE, CNRS, Gif-sur-Yvette, FR

Biophysics and Neural Computations Underlying Visually-Guided Collision Avoidance Behaviors

- F. GABBIANI, Baylor College of Medicine, Huston, TX, US

Closed-loop robotic control using spiking neural networks

- A. PEDROCCHI, Politecnico di Milano, IT

Models of brain systems: the connectome

The need for brain connectomic and the role of structural and functional MRI

- C. GANDINI WHEELER-KINGSHOTT, University College London, UK

From structural to functional connectivity networks, via emergent dynamics

- D. BATTAGLIA, Aix Marseille Université, Marseille, FR

Micro and macro network analysis of the connectome

- M. VAN DER HEUVEL, University Medical Center, Utrecht, NL

Functional network modelling using fMRI

- E. DUFF, Oxford University, UK

Software for connectomics

- M. VAN DER HEUVEL, University Medical Center, Utrecht, NL

- E. DUFF, Oxford University, UK

PURPOSE OF THE COURSE

The 2015 Course of the *school of brain cells and circuits* will be dedicated to brain modeling and theory. *Bottom-up* models, descending from cellular and molecular biophysics, and *top-down* models, derived from neuropsychology and non-invasive brain measurements (mostly brain imaging using MRI), are both needed to integrate the micro-, meso and macro-scale of brain organization and to pilot future experimentation. Brain theories need to interface with new experimental measurements and cellular circuit models simulations. This approach requires merging expertise and knowledge deriving from different disciplines, from Physics and Mathematics to Biology, Psychology and Medicine. The 2015 Course will gather scientists providing an integrated view of this enormous field with the aim of teaching the foundations of brain modeling and theory.

APPLICATIONS

Participants wishing to attend the Course should visit the website www.eric-golgi.org and fill the application form. For further information email eric.golgi@gmail.com

PLEASE NOTE

Participants must arrive in Erice on November 29, no later than 7 p.m.

More information about the other activities of the
«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE
can be found on the WWW at the following address:
<http://www.csem.infn.it>

POETIC TOUCH

According to legend, Erice, son of Venus and Neptune, founded a small town on top of a mountain (750 metres above sea level) more than three thousand years ago. The founder of modern history — i.e. the recording of events in a methodic and chronological sequence as they really happened without reference to mythical causes — the great Thucydides (~500 B.C.), writing about events connected with the conquest of Troy (1183 B.C.) said: «*After the fall of Troy some Trojans on their escape from the Achaei arrived in Sicily by boat and as they settled near the border with the Sicilians all together they were named Elymi: their towns were Segesta and Erice.*» This inspired Virgil to describe the arrival of the Trojan royal family in Erice and the burial of Anchise, by his son Enea, on the coast below Erice. Homer (~1000 B.C.), Theocritus (~300 B.C.), Polybius (~200 B.C.), Virgil (~50 B.C.), Horace (~20 B.C.), and others have celebrated this magnificent spot in Sicily in their poems. During seven centuries (XIII-XIX) the town of Erice was under the leadership of a local oligarchy, whose wisdom assured a long period of cultural development and economic prosperity which in turn gave rise to the many churches, monasteries and private palaces which you see today. In Erice you can admire the Castle of Venus, the Cyclopean Walls (~800 B.C.) and the Gothic Cathedral (~1300 A.D.). Erice is at present a mixture of ancient and medieval architecture. Other masterpieces of ancient civilization are to be found in the neighbourhood: at Motya (Phoenician), Segesta (Elymian), and Selinunte (Greek). On the Aegadian Islands — theatre of the decisive naval battle of the first Punic War (264-241 B.C.) — suggestive neolithic and paleolithic vestiges are still visible: the grottoes of Favignana, the carvings and murals of Levanzo.

Splendid beaches are to be found at San Vito Lo Capo, Scopello, and Corino, and a wild and rocky coast around Monte Cofano: all at less than one hour's drive from Erice.