INTERNATIONAL SCHOOL OF BRAIN CELLS AND CIRCUITS «CAMILLO GOLGI»

5th Course: MODELING THE BRAIN AND ITS PATHOLOGIES

ERICE-SICILY: 27 AUGUST – 1 SEPTEMBER 2019

Sponsored by the: Italian Ministry of Education, University and Scientific Research • Sicilian Regional Government • Museo Storico della Fisica e Centro Studi e Ricerche "Enrico Fermi" • Almo Collegio Borromeo • Frontiers in Cellular Neuroscience • Human Brain Project Education Programme

PROGRAMME AND LECTURERS

I – Different modeling approaches
Why modeling the brain? And which strategy should be used?
• E. D’ANGELO, University of Pavia, IT
• C. GANDINI WHEELER-KINGSHOTT, University College London, UK; University of Pavia, IT
• V. JIRSA, AIX Marseille Université, Marseille, FR

The interplay of theory, models and experiments: Lessons from exemplar cases
• E. D’ANGELO, University of Pavia, IT

Physiologically realistic models
• M. MIGLIORE, CNR Palermo, IT

Mean field models
• A. DESTEXHE, Paris-Saclay Institute of Neuroscience, Gif-sur-Yvette, FR

Phenomenological models
• M. SAGGIO, AIX Marseille Université, Marseille, FR

Data-driven models of the mouse mesoscale connectome: Network structure and functionality
• H. CHOI, Allen Institute, Seattle, WA, US

Mathematical modeling of large-scale brain dynamics
• S. COOMBS, University of Nottingham, Nottingham, UK

II – Modeling brain data and signals

Human data: BOLD and sodium fMRI
• C. GANDINI WHEELER-KINGSHOTT, University College London, UK; University of Pavia, IT

Microstructure modelling through MRI
• D. ALEXANDER, University College London, UK

Modeling structural connectivity
• A. DADUCCI, Verona University, IT

Modelling Whole-Brain Dynamical Activity
• G. DECO, Pompeu Fabra University, Barcelona, ES

Model inversion: “The virtual brain approach
• V. JIRSA, AIX Marseille Université, Marseille, FR

III – Clinical and technical applications

Bio-inspired closed loop robotic controllers
• E. FALOTICO, Sant’Anna School of Advanced Studies, Pisa, IT

Proof of concept of pathology modelling with closed loop simulations
• C. CASELLATO, University of Pavia, IT

Modeling of brain states in pathology: epilepsy
• J. TERRY, University of Exeter, Exeter, UK

Modeling brain pathology: Towards a better comprehension of AD dementia
• A. REDOLFI, IRCCS Centro S. Giovanni di Dio-Filippenso, Brescia, IT

Modeling multiscale drug effects on brain dynamics
• H.R. NOORI, Max Planck Institute, Tübingen, DE

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 Achaean army arrived in Sicily by boat and as they settled near the border with the Sicaniads all together they were named Elymians: 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 (~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 Aegeadian 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 Ciminna, and a wild and rocky coast around Monte Cofano: all at less than one hour’s drive from Erice.

E. D’ANGELO – C. GANDINI WHEELER-KINGSHOTT – V. JIRSA
DIRECTORS OF THE COURSE

E. D’ANGELO – C. GANDINI WHEELER-KINGSHOTT
DIRECTORS OF THE SCHOOL

A. ZICCHICI
PRESIDENT EMFSC

APPLICATIONS

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

PLEASE NOTE

Participants must arrive in Erice on August 27, no later than 17:00 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.ecoms.info.it