



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



INTERNATIONAL SCHOOL ON NEURAL NETS «EDUARDO R. CAIANIELLO»

8th Course: DYNAMIC BRAIN

ERICE-SICILY: 5 – 12 DECEMBER 2007

Sponsored by the: • Italian Ministry of Education, University and Scientific Research • Sicilian Regional Government
• RIKEN Brain Science Institute (BSI) • Department of Physics "E.R. Caianiello", University of Salerno
• International Institute for Advanced Scientific Studies (IIASS)

TOPICS AND LECTURERS

Nonlinear Dynamics and neural networks

System dynamics in the olfactory system

Path integration in the Hippocampus

Hippocampus cognitive map theory and theta precession

Dynamical linking by synchronization in the brain

Theta rhythm in bat hippocampus

Cortical dynamics modelling

Computational theory of real time computing in the brain

Computational model of hippocampus and human memory

- M. DIESMANN, RIKEN BSI, JP
- S. GRUEN, RIKEN BSI, JP
- M. HASSELMO, Boston University, MA, US
- L.M. KAY, University of Chicago, IL, US
- M. MARINARO, University of Salerno, IT
- B. McNAUGHTON, University of Arizona, AZ, US
- J. O'KEEFE, University College of London, UK
- N. SATO, RIKEN BSI, JP
- S. SCARPETTA, University of Salerno, IT
- W. SINGER, Max Planck Institute for Brain Research, Frankfurt, DE
- N. ULANOVSKY, Weizmann Institute of Science, Rehovot, IL
- Y. YAMAGUCHI, RIKEN BSI, JP

PURPOSE OF THE COURSE

Recent development in studies of neurons, neural networks and cognitive behaviours indicates crucial roles of their dynamical properties in representation of information in the brain.

We now seem to face to the complexity of these dynamical properties to solve the principle of brain computation. The approach must be essentially interdisciplinary. Most of all, bridging between theoretical studies and experimental studies is crucial to solve the principle.

The School is devoted to graduate students and researchers with different scientific background (including physics, mathematics, biology, neuroscience, etc) who wish to learn brain science beyond the boundary of their fields. Each lecture is to include basic guidance in each field. Topics of lectures include visual system, olfactory system, hippocampus memory and behavioural levels, where frontier efforts in these decades have been successfully linked to recent remarkable evolution.

The goal of the School is to present a systematic description of dynamics in the brain toward understanding the computational theory in the brain. The course is organized as a series of lectures, complemented by participants short presentations. We aim to promote a relaxed atmosphere which will encourage informal interactions between all participants and hopefully will lead to new professional relationships which will last beyond the School.

APPLICATIONS

Persons wishing to attend the School are requested to fill in the application form available at the following address:

<http://www.fisica.unisa.it/dynamicbrain>

or write to:

- Dr. Silvia SCARPETTA
Dipartimento di Scienze Fisiche "E.R. Caianiello" – Università di Salerno
Via S. Allende – 84081 BARONISSI (SA), Italy
Tel +39 089 965235 – Fax +39 089 965275

They should specify:

- date and place of birth, together with present nationality, current address, telephone number, and e-mail;
- degree and other academic qualifications;
- present position, place of work, research interests and motivation of application to this School.

Closing date for Applications: September 30, 2007

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 methodical 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 Sicanians 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 Cornino, and a wild and rocky coast around Monte Cofano: all at less than one hour's drive from Erice.

More information about the «Ettore Majorana» Foundation and Centre for Scientific Culture can be found on the WWW at the following address:
<http://www.ccsem.infn.it>

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- PLEASE NOTE
Participants should arrive in Erice on December 5, not later than 7 pm.