



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 of Bioelectromagnetics Alessandro Chiabrera

7th COURSE: "Biological effects of combined exposures to EMF and other chemical and physical agents"

ERICE-SICILY: 23 - 29 April 2014

Director of the School: Prof. F. Bersani (University of Bologna, Italy)

Directors of the Course: Dr. M.R. Scarfì (CNR-IREA, Italy), Prof. M. Mattsson (AIT, Austria)

**Sponsored by the: •Sicilian Regional Government •European Bioelectromagnetic Association (EBEA)
•Centro Interuniversitario per lo studio delle Interazioni tra Campi Elettromagnetici e Biosistemi (ICEmB)•
IGEA Clinical Biophysics (Carpì, Italy)• Rohde & Schwarz• World Health Organization (WHO)**

The Centre for Scientific Culture in Erice (Sicily, Italy) is named after the great Italian scientist Ettore Majorana. Antonino Zichichi, the President of the Centre, has said: "At Erice, those who come in order to follow a certain School are called 'students', but actually they are young people who have successfully completed their University studies and who come to Erice in order to learn what the new problems are. However, what is distinctive for Erice is the spirit animating all participants: students no less than teachers. The prime objective is to learn. The student listens to the lectures and after that comes the most amusing part: the discussion session."

Topics in Bioelectromagnetics have come to Erice many times in the past, especially in the 1980s, with international courses and workshops on non-ionizing radiation, and today many participants of those courses contribute greatly to the development of this research field.

Following the request of the European Bioelectromagnetics Association (EBEA) and the Inter-University Centre for the study of the Interaction between Electromagnetic Fields and Biosystems (ICEmB), in 2003 the Ettore Majorana Centre has established a Permanent School of Bioelectromagnetics, named after Alessandro Chiabrera, who is considered as a master by the young scientists of the two organizations.

PURPOSE OF THE COURSE

The seventh Course is addressed to young researchers and to biologists, engineers and physicians who conduct research on bioelectromagnetics or work in a medical environment. The widespread diffusion of Information & Communication Technology, energy transmission and delivery as well as of therapeutic and diagnostic technologies based on non-ionizing electromagnetic radiation makes the exposure to electromagnetic fields ubiquitous and unavoidable for humans. However, the real-life exposure to electromagnetic fields always occurs in presence of other physical and/or chemical agents and pollutants, giving rise to a more complex exposure scenario. Therefore, studying the effect of combined exposures is a present hot topic in Bioelectromagnetics. Moreover, many of the already described biological effects involve cooperation between electromagnetic fields and other chemical or physical agents. The aim of the VII course of the Erice Bioelectromagnetics school will be to provide participants with insights into the realm of the potential of electromagnetic fields in interacting with biological materials together with other agents.

APPLICATION

Interested candidates should send an e-mail to the Directors of the Course at the following e-mail address: school@ebea.org with the following information:

- A short Curriculum Vitae
- Scientific interest of the candidate
- Students: a letter of recommendation of a Senior Scientist

In case of acceptance the candidate will be informed by e-mail.

The deadline for sending the requests of participation to the School is March 15

The registration fee is € 1300, including food and lodging.

For those who are accepted, information will be given concerning the way of payment of the course fee.

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 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 Anchises, by his son Aeneas, 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.

More information about the School can be found on the EBEA website:
<http://www.ebea.org>

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>

Programme

WEDNESDAY, APRIL 23, 2014 - 9:00 AM – 6:30 PM

9:00 – 9:30 AM

Welcome: L. Mir, F. Bersani, M.R. Scarfi, M.-O. Mattsson

Introduction to the course

9:30 – 10:00 AM

General remarks and introduction to combined exposures
F. Bersani, M.R. Scarfi, M.-O. Mattsson

10:00 – 11:00 AM

Combined exposures – a pharmacological perspective
J. Bridges (University of Surrey, Guildford, UK)

11:00 - 11:30 AM Coffee break

11:30 – 12:30 AM

Mathematical/quantitative approach to combined exposures
D. Remondini (University of Bologna, Italy)

12:30 - 2:00 PM Lunch

Study approaches and biological endpoints

2:00 – 3:00 PM

Designing Co-exposures Studies
Vijayalaxmi (University of San Antonio, Texas, USA)

3:00 – 4:00 PM

Systems biology in EMF research
M. Simko (Austrian Institute of Technology, Vienna, Austria)

4:00 - 4:30 PM Coffee break

4:30 – 5:30 PM

Epigenetic approach in EMF research
M. Simko (Austrian Institute of Technology, Vienna, Austria)

5:30 – 6:30 PM

Epidemiology and combined exposures
S. Lagorio (National Health Institute, Rome, Italy)

After dinner Seminar

Methods of analysis in systems biology
G. Castellani (University of Bologna, Italy)

THURSDAY, APRIL 24, 2014 - 9:00 AM – 6:30 PM

Combined ELF EMFs and chemical exposures

9:00 – 10:00 AM

In vitro studies – overview
J. Juutilainen (University of Eastern Finland, Kuopio, Finland)

10:00 – 11:00 AM

In vitro selected studies
M.-O. Mattsson (Austrian Institute of Technology, Vienna, Austria)

11:00 - 11:30 AM Coffee break

11:30 – 12:30 AM

In vivo studies

C. Dasenbrock (Fraunhofer Institute for Toxicology and Experimental Medicine, Hannover, Germany)

12:30 - 2:00 PM Lunch

Combined RF EMFs and chemical exposures

2:00 – 3:00 PM

In vitro studies – overview

O. Zeni (National Research Council, IREA, Naples, Italy)

3:00 – 4:00 PM

In vitro selected studies

I. Lagroye (University of Bordeaux, France)

4:00 - 4:30 PM Coffee break

4:30 – 5:30 PM

In vivo studies

Z. Sienkiewicz (Health Protection Agency, Chilton, Oxfordshire, UK)

Combined static field and chemical or physical exposures

5:30 – 6:30 PM

In vitro and *in vivo* studies

E. van Rongen (Health Council of the Netherlands)

After dinner Seminar

Presentation of the COST action EMF-MED BM1309

A. Sarolic (University of Split, Croatia)

FRYDAY, APRIL 25, 2014 - 9:00 AM – 7:00 PM

Combined ionizing (IR) or ultraviolet (UV) and non-ionizing (NIR) radiation exposures

9:00 – 10:00 AM

IR effects – overview (terminology, dose concept, models of action)

A. Cebulska-Wasilewska (Polish Academy of Science, Kraków, Poland)

10:00 – 11:00 AM

IR or UV and ELF EMF-exposure studies

J. Juutilainen (University of Eastern Finland, Kuopio, Finland)

11:00 - 11:30 AM Coffee break

11:30 – 12:30 AM

IR or UV and RF EMF-exposure studies

J. Juutilainen (University of Eastern Finland, Kuopio, Finland)

12:30 - 2:00 PM Lunch

2:00 – 3:30 PM

Round table

Lessons learned from IR studies

Chair: A. Cebulska-Wasilewska (Polish Academy of Science, Kraków, Poland)

3:30 - 4:00 PM Coffee break

Adaptive Response

4:00 – 5:00 PM

RF-induced adaptive response – *in vitro* studies

M.R. Scarfi (National Research Council, IREA, Naples, Italy)

5:00 – 6:00 PM

RF-induced adaptive response – *in vivo* studies

Y. Cao (Soochow University, People's Republic of China)

6:00 – 7:00

Seminar

RF-ELF-Adaptive Response: Gaps in Knowledge

M.R. Scarfi, Y. Cao, Vijayalaxmi

SATURDAY, APRIL 26, 2014 - 9:00 AM – 6:30 PM

Co-exposures to different non-ionizing EMFs

9:00 – 10:00 AM

EMF co-exposure studies

M.-O. Mattsson (Austrian Institute of Technology, Vienna, Austria)

10:00 – 11:00 AM

MRI-related studies

J. Karpowicz (CIOP-PIB, Warsaw, Poland)

11:00 - 11:30 AM Coffee break

Mechanisms

11:30 – 12:30 AM

Fundamental mechanisms for ELF EMF

F. Bersani (University of Bologna, Italy)

12:30 – 2:00 PM Lunch

2:00 – 3:00 PM

Fundamental mechanisms beyond the thermal effects for RF EMF

G. d'Inzeo (University of Rome, Italy)

3:00 – 4:00 PM

Fundamental mechanisms for static magnetic fields

F. Bersani (University of Bologna, Italy)

4:00 - 4:30 PM Coffee break

4:30 – 5:30 PM

Seminar

Resonance Hypotheses for Non-Thermal EMF Interactions

D. Muehsam (University of Bologna, Italy)

5:30 – 6:30 PM

Seminar

Methods and instrumentation for environmental EMF measurements

D. Scarano (Rohde & Schwarz, Italy)

SUNDAY, APRIL 27, 2014

FREE

Visit Erice surroundings

MONDAY, APRIL 28, 2014 - 9:00 AM – 6:30 PM

Biomedical applications

9:00 – 10:00 AM

Overview of therapeutic applications of combined exposures

L.M. Mir (CNRS University Paris-Sud, France)

10:00 – 11:00 AM

Basic mechanisms of electroporation

L.M. Mir (CNRS University Paris-Sud, France)

11:00 - 11:30 AM Coffee break

11:30 – 12:30 AM

Clinical applications and future research of electroporation-based transfer of drugs (electrochemotherapy)

R. Cadossi (R&D IGEA, Carpi, Italy)

12:30 – 2:00 PM Lunch

2:00 – 3:30 PM

Round table

Which mechanisms for combined exposure? / Combined exposures for understanding mechanisms of EMFs.

Chair: J. Juutilainen (University of Eastern Finland, Kuopio, Finland)

Poster session

3:30 – 5:00 PM

Students will be at their poster to answer questions

5:00 - 5:30 PM Coffee break

5:30 – 6:30 PM

Three selected posters will be presented – 15 min each

8:30 PM Social dinner

TUESDAY, APRIL 29, 2014

9:30 – 12:30 PM

Concluding session

How to study combined exposures, their possible applications and research needs and priorities

School conclusion