

**Ettore Majorana Foundation and Centre for Scientific Culture**  
**International School of Bioelectromagnetics “Alessandro Chiabrera”**

*Director of the School: F. Bersani (University of Bologna,I)*

The Centre for Scientific Culture in Erice (Sicily, Italy) is named after the great Italian scientist Ettore Majorana. Antonino Zichichi, the director 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 the lunch break 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-ionising 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 Italian 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. This year the school is pleased to present the:

**3<sup>rd</sup> COURSE:**

**“Mechanisms of interaction between electromagnetic fields and biological systems”**

Erice (Sicily, Italy): November 19-25, 2006

Sponsored by the Italian Ministry of University and Scientific Research, the Sicilian Regional Government, the European Bioelectromagnetics Association (EBEA), the World Health Organization (WHO), the EMF-NET (EC FP6 Coordination Action), and by the Centro Interuniversitario per lo Studio delle Interazioni tra Campi Elettromagnetici e Biosistemi (ICEmB).

**Directors of the Course:**

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The third Course of the School will cover different aspects of interaction mechanisms between electromagnetic fields and biological systems, including a discussion on their implications for *in vivo* and *in vitro* studies. All areas of interest will be covered by lectures, seminars, and discussions where senior scientists will share with participants their own experience. Round tables on specific items will be organised jointly with the European Coordination Action EMF-NET.

**Diploma for the best poster presentation**

The last day will be partially devoted to poster presentations by participants. A diploma will be awarded by a Scientific Committee to the author of the best poster.

**Participation fee:** 1200€ including food and lodging.

**Application:** Interested candidates should send an e-mail to the Directors of the Course at the following e-mail address: [ebea-icembschool@icemb.org](mailto:ebea-icembschool@icemb.org) with the following information:

- A short Curriculum Vitae
- Scientific interest of the candidate
- For young Researchers: letter of recommendation of a Senior Scientist by e-mail (attached Word or PDF file)

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

The deadline for sending the requests of participation to the School is October 13<sup>th</sup>, 2006

The participation fee can be paid directly into the Bank Account of the Erice E. Majorana Centre indicating the motivation (Participation to the second Course of the International School of Bioelectromagnetics “Alessandro Chiabrera”) or directly to the School on arrival in Erice.

Bank Account: Banco di Sicilia, Erice

Bank code for National participants (BBAN): T0102081850000410041482

Bank code for International participants (IBAN): IT40T0102081850000410041482

For details about the Ettore Majorana Centre: [www.ccsem.infn.it](http://www.ccsem.infn.it)

**Please note:** Participants must arrive in Erice on November 19<sup>th</sup>, possibly not later than 6 p.m.

### Preliminary PROGRAMME

Arrival: November 19<sup>th</sup>; Course: November 20<sup>th</sup> to November 24<sup>th</sup>; Departure: November 25<sup>th</sup>

### Preliminary TOPICS AND LECTURERS

Cellular Structure: Compartments and Components
Biophysical Properties of Membrane
Ion Channels Properties and Dynamics and/or Electrical Activity of the Cells
Ligand Binding and Signal Transduction
Roles of the Calcium Ion
Gene Expression and System
Fields: Spectrum Overview and EM Forces
Theoretical and Experimental Dosimetry
Microdosimetry: Fields on Cell Compartments
Molecular Dynamics and Enzymatic Reactions
Quantum Mechanical Models
Quantum Approach and Molecular Dynamics Results
Enzymatic Reactions (Effects)
Magnetomechanical Mechanisms: Torque, Magnetite Magnetophoresis, Anisotropic Diamagnetism
Radical Pair Mechanism
Clues from Animal Magnetodetection
Membrane Channels (Effects and Modelling)
History of Research on Cellular Systems
Macromolecular Modelling
Cells (Modelling of Interaction )
Calcium Dependent Effects
Liposomes, Bi-Layers, Cells Communication (Effects/Modelling)
Resonance Hypotheses
Thresholds for Detection of Magnetic and Electric Fields – Experimental and Theoretical Perspectives
Collective Systems
Round Tables (preliminary):
• Thermal versus Specific Effects
• Thermal Noise and Stochastic Resonance
• Report on September FGF/COST, Rostok Meeting
• Overview of Physical Interaction Mechanisms

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M. Bier ( <i>East Carolina University, USA</i> )
L. J. Challis ( <i>Emeritus @University of Nottingham, UK</i> )
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S. Engstrom ( <i>Vanderbilt University, USA</i> )
M. Liberti ( <i>ICEmB @ Univ. of Rome “La Sapienza, IT</i> )
R. O’Connor ( <i>The Babraham Institute Cambridge, UK</i> )
E. Prohofsky ( <i>Purdue University, USA</i> )
I. Pepe ( <i>University of Genova, IT</i> )
T. Ritz ( <i>University of California Irvine, USA</i> )
B. Veyret ( <i>CNRS, Bordeaux, FR</i> )
<i>Others to be determined</i>