



«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 SOLID STATE PHYSICS

## 31st Course: COMPLEXITY, METASTABILITY AND NONEXTENSIVITY

ERICE-SICILY: 20 - 26 JULY 2004

Sponsored by the: European Science Foundation • INFN • Italian Ministry of Education, University and Scientific Research  
• Sicilian Regional Government • University of Catania • University of Palermo

### TOPICS AND LECTURERS

#### Complexity in internet and earthquakes networks

- S. ABE, University of Tsukuba, J

#### Complexity in the brain

- F.T. ARECCHI, University of Florence, I

#### Superstatistics

- C. BECK, University of London, UK

#### Fractal growth of carbon schwarzites

- G. BENEDEK, University of Milan, I

#### Complexity in solid state physics

- A.R. BISHOP, Los Alamos Nat. Lab, NM, USA

#### Lattice-Boltzmann models

- B. M. BOGHOSIAN, Tufts University, Medford, MA, USA

#### Random geometric graphs

- B. BOLLOBAS, University of Memphis, TN, USA

#### Non-Gaussian effects in financial markets

- L. BORLAND, San Francisco, CA, USA

#### Econophysics and glasses

- J-P. BOUCHAUD, Saclay, Gif-Sur-Yvette, F

#### Dynamical instability, diffusion and Fourier heat law

- G. CASATI, University of Insubria, Como, I

#### Nonequilibrium statistical mechanics

- E.G.D. COHEN, Rockefeller University, New York, NY, USA

#### Granular systems

- A. CONIGLIO, University of Naples, I

#### Networks and mesoscopic clusters

- J. DOYE, University of Cambridge, UK

#### Active Brownian particles - stochastic dynamics of swarm systems

- W. EBELING, Humboldt University, Berlin, D

#### Models of financial markets

- D. FARMER, Santa Fe Institute, NM, USA

#### Experiments in granular systems

- J.P. GOLLUB, Haverford University, PA, USA

#### Anomalous diffusion and intermittency

- P. GRIGOLINI, University of North Texas, Denton, TX, USA

#### Stochastic dynamics

- P. HANGGI, Augsburg University, D

#### Complexity in biological systems

- K. KANEKO, Tokyo University, J

#### Architecture of complex systems

- V. LATORA, University of Catania, I

#### Complexity in financial markets

- R.N. MANTEGNA, University of Palermo, I

#### Noise and fluctuations

- F. MARCHESONI, University of Camerino, I

#### SOC models

- M. PACZUSKI, Imperial College, London, UK

#### Complexity in cosmic structures

- L. PIETRONERO, University of Rome, I

#### Dynamics in low dimensional lattices

- A. PROVATA, Demokritos Center, Athens, GR

#### Metastability and glassy dynamics in Hamiltonian systems

- A. RAPISARDA, University of Catania, I

#### Aging and glassy states in maps

- A. ROBLEDO, UNAM, Mexico City, MEX

#### Nucleation and critical phenomena in earthquakes and other driven threshold systems

- J. RUNDLE, Center for Comp. Sci. and Engineering, Davis, CA, USA

#### Models of complex systems

- H.E. STANLEY, Boston University, MA, USA

#### Aging and spin-glasses

- F.A. TAMARIT, University of Cordoba, RA

#### Nonextensive statistical mechanics

- C. TSALLIS, CBPF, Rio de Janeiro, Brazil and Santa Fe Institute, NM, USA

#### Diffusion in complex networks

- A. VESPIGNANI, LPT, Orsay, F

#### Complexity in collective behavior

- T. VICSEK, Eotvos University, Budapest, H

#### Complexity at the elementary level

- A. ZICHICHI, INFN & University, Bologna, I, and CERN, Geneva, CH

### PURPOSE OF THE COURSE

There is increasing evidence that a large class of complex, usually nonequilibrium, phenomena in different fields such as for instance physics, chemistry, geophysics, biophysics and econophysics, share similar dynamical and structural properties. Such phenomena include self-organization, metastability, anomalous relaxation, aging, glassy states, amorphous clustering, non-Gaussian distributions, non-Markovian processes, mesoscopic dissipation, scale-invariant growth, among others. The aim of the meeting is to emphasize common features that could reveal unifying concepts within a general theoretical framework.

### APPLICATIONS

Persons wishing to attend the Course should apply in writing to:

- 1 Professor Andrea RAPISARDA  
Università di Catania  
Dipartimento di Fisica e Astronomia  
& INFN Sezione di Catania  
Via S. Sofia, 64 I-95123 CATANIA - Italy  
Tel ++39 095 378 5408 - Fax ++39 095 378 5231  
e-mail: [andrea.rapisarda@ct.infn.it](mailto:andrea.rapisarda@ct.infn.it)  
[www.ct.infn.it/~rapis/ERICE-COMPLEX04](http://www.ct.infn.it/~rapis/ERICE-COMPLEX04)

specifying:

- i) full name(s), address, age, nationality;
- ii) academic qualifications, present position and affiliation and/or a short CV;
- iii) their specific interest in the Course.

#### • PLEASE NOTE

Participants must arrive in Erice on July 20, not later than 5 pm.

### 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 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 other activities of the Ettore Majorana Centre can be found on the WWW at the following address:  
<http://www.ccsem.infn.it>

C. BECK - A. RAPISARDA - C. TSALLIS  
DIRECTORS OF THE COURSE

G. BENEDEK  
DIRECTOR OF THE SCHOOL

A. ZICHICHI  
EMFCSC PRESIDENT AND DIRECTOR OF THE CENTRE