



«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 CRYSTALLOGRAPHY

## 41st Course: HIGH-PRESSURE CRYSTALLOGRAPHY: FROM NOVEL EXPERIMENTAL APPROACHES TO CUTTING-EDGE TECHNOLOGIES

ERICE-SICILY: 4 – 14 JUNE 2009

Sponsored by the: • **COMPRES** • International Union of Crystallography  
• Italian Ministry of Education, University and Scientific Research • Sicilian Regional Government

### PROGRAMME AND LECTURERS

#### TECHNIQUES

*Devices for pressure generation*  
*Pressure measurement / calibration*  
*High-pressure experiments at variable temperature*  
*Single-crystal and powder diffraction with X-rays and neutrons*  
*Spectroscopy*  
*Electric and magnetic measurements*  
*Calorimetry*  
*High-pressure techniques at large facilities*  
*Theoretical methods for high-pressure science*

#### PHENOMENA AND PROPERTIES

*Strain, compressibility, equation of state*  
*Phase transitions*  
*Amorphous and crystalline solids*  
*Planetary sciences and mineral physics*  
*Synthesis and solid-state reactivity*  
*Materials (ferroelectrics, super-hard materials, nanomaterials, etc.)*  
*Explosives and energetic materials*  
*Soft matter, biomolecules, drugs and biomimetics*  
*Food processing*  
*High-pressure crystallization*

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• R. WINTER, University of Dortmund, DE

#### PURPOSE OF THE COURSE

As a thermodynamic parameter, pressure is remarkable in many ways. It spans in the visible universe over sixty orders of magnitude, from the non-equilibrium pressure of hydrogen in intergalactic space, to the kind of pressure encountered within neutron stars. In the laboratory, it provides unique possibility to control structure and properties of materials, dramatically alter electronic properties, break existing, or form new chemical bonds by reaching compressions in excess of an order of magnitude for molecular materials.

This agenda naturally encompasses elements of physics (properties and structure), chemistry (chemical reactions, transport), materials science (new materials) and engineering (mechanical properties); in addition it has direct applications and implications for geology (minerals in their natural, deep earth environments), planetary sciences, biology and medicine (deep sea ecosystems, membranes, protein and nucleic acid folding, the role of high-pressure in the origin of prebiotic forms of matter and the origin of life, des-activation of viruses and toxins).

Beyond its specificity, high-pressure science finds direct or indirect (i.e. economic) application in several fields of modern technology, such as mechanical engineering (strain/stress analysis), optoelectronics and spintronics, nanotechnology, pharmaceutical industry, food processing, petroleum industry, seismic data interpretation, etc.

#### APPLICATIONS

Interested candidates should register by 30 November 2008 using the format available at the URL <http://erice2009.azuleon.org> or write to the Executive Secretary of the International School of Crystallography:

• Professor Paola Spadon  
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specifying:

- i) full name(s), age, gender, citizenship;
- ii) postal address, phone, fax, electronic mail;
- iii) present academic position and scientific interests;
- iv) the title or abstract of a scientific contribution to the poster session(s) which might be included in the programme.

Young researchers please add a list of no more than five scientific publications and a letter of recommendation from the group leader or a senior scientist, where the amount of support, if needed, is justified. In order to reflect the multi-disciplinary nature of the Course, attendance will be encouraged on the basis of the scientific discipline, publication record and the correspondence between the current research of the applying scientists and the listed topics.

#### 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 Sicilians 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 International School of Crystallography can be found on the WWW at the following address:  
<http://www.crystalleric.org>

#### PLEASE NOTE

Participants must arrive in Erice on June 4, 2009, not later than 8 p.m.

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