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

INTERNATIONAL SCHOOL OF QUANTUM ELECTRONICS

67th Course:

THE FRONTIERS OF ATTOSECOND AND ULTRAFAST X-RAY SCIENCE

ERICE-SICILY: 26 - 31 MARCH 2023

Sponsored by the: • Italian Ministry of Education, University and Scientific Research • Sicilian Regional Government

PROGRAMME AND LECTURERS

Laser technology for Attosecond science
• L. GALLMANN, ETH, Zurich, CH

Fundamentals of strong field physics
• M. IVANOV, Max Born Institute, Berlin, DE

Attosecond atomic physics
• A. L'HUILLIER, Lund University, SE

Attosecond solid state physics
• M. LUCCHINI, Politecnico di Milano, IT

XFELs General theory. Attosecond FELs and applications
• A. MARINELLI, SLAC National Accelerator Laboratory, Stanford, CA, US

Attosecond molecular physics – Theory
• F. MARTÍN, Universidad Autonoma de Madrid, ES

X-ray optics
• L. POLETTO, IFN-CNR, Padova, IT

Attosecond metrology
• P. SALIERES, CEA-Saclay, FR

Attosecond molecular physics – Experiments
• M. VRAKKING, Max Born Institute, Berlin, DE

PURPOSE OF THE COURSE

The new millennium witnessed two revolutionary breakthroughs in ultrafast x-ray science. In 2001, two independent groups reported the formation of attosecond pulses of XUV radiation. Since that time, the field of attosecond science has grown exponentially and new attosecond laboratories have emerged throughout the world. Similarly, in 2009 the world's first x-ray free-electron laser, XFEL, known as LCLS, became operational at SLAC in the USA. The LCLS has produced unprecedented coherent x-ray pulses with femtosecond brevity and gigawatt peak power. These x-ray devices impact is far reaching encompassing applications in fundamental physics to the biological sciences. Since the operation of the LCLS, a number of XFELs have or will become operational in the near future. The tremendous growth in these two related areas will require the training of young scientists who will push the technology and applications. The primary objective of this school is to educate the next generation of scientists who will influence the future of attosecond and ultrafast x-ray science. The school meets on a regular basis every two years and is becoming a foundation for the ultrafast community. This year the School is co-organized with the COST Action Attochem. The AttoChem network coordinates experimental and theoretical efforts to exploit the large potential of attosecond techniques in chemistry, with the aim of designing new strategies for the control of charge migration in molecules by directly acting on the attosecond time scale. The purpose of the Course is to provide young researchers involved within the Action with training on current developments on attosecond experiments. In particular: (i) attosecond science and technology, devoted to the generation and application of attosecond pulses to the investigation of electronic dynamics in atoms, molecules, nanostructures and condensed phases; (ii) fundamentals, methods and applications of free electron lasers in atomic and molecular science.

APPLICATIONS

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

Professor Mauro NISOLI
Politecnico di Milano, IT
email: *info@erice-attosecond.it*

Please include the following information in your application: i) Full name(s), age, gender, citizenship; ii) Postal address, phone, fax, electronic mail; iii) Your 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.

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.

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

PLEASE NOTE
Participants must arrive in Erice no later than 7 p.m. on 26th March 2023.

L. DIMAURO – M. NISOLI
DIRECTORS OF THE COURSE

A.N. CHESTER – D.S. WIERSMA
DIRECTORS OF THE SCHOOL

A. ZICHICHI
EMFCSC PRESIDENT