«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 SOLID STATE PHYSICS

73rd Course: *FRONTIERS OF PHOTONICS, PLASMONICS AND ELECTRONICS WITH 2D NANOSYSTEMS*

ERICE-SICILY: 14 – 20 JULY 2018

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

PROGRAMME AND LECTURERS

Plasmonic and polaritonic phenomena in two-dimensional van der Waals materials
• D. BASOV, Columbia University, New York, NY, US

Tunable non linear metasurfaces
• M. BELKIN, University of Texas, Austin, TX, US

Plasmonics, metamaterials and flat optics
• F. CAPASSO, Harvard School of Engineering and Applied Sciences, Cambridge, MA, US

Graphene and two-dimensional van der Waals heterostructures
• A. FERRARI, University of Cambridge, UK

Ultrafast terahertz spectroscopy
• F. HEGMANN, Fritz-Haber-Institut der MPG, Berlin, DE

Nanophotonics and Quantum Optics
• F. KOPPENS, IFCO, Barcelona, ES

Theory of plasmonics and metamaterials
• L. MARTIN-MORENO, Instituto de Ciencia de Materiales de Aragon, Saragoza, ES

Functional nanostructures
• R.G. NUZZO, University of Illinois, Urbana, IL, US

Interfacing cells with organic devices
• R. OWENS, University of Cambridge, UK

Oxide-based materials and devices
• M. RAZEGHI, Northwestern University, Evanston, IL, US

Spectroscopy of graphene and topological insulators
• C. STAMPFER, Aachen University, Aachen, DE

Organic bioelectronic sensing
• L. TORSI, University of Bari, Italy

THz ultrafast spectroscopy in quantum devices
• K. UNTERRAINER, Technische Universität Wien, AT

Advanced materials for nanophotonics
• N.I. ZHELUDEV, University of Southampton, UK

PURPOSE OF THE COURSE

Controlled fabrication of two-dimensional van der Waals material structures, ultra-thin functionalized surfaces, self-assembled monolayers and metamaterials reveal a wealth of interesting physical phenomena and offers unprecedented opportunities to tailor microscopic and macroscopic physical properties of such systems. Further opportunities are presented by hybrid surfaces, e.g. nanostructured inorganic or organic material surfaces functionalized with biological molecules. Recent breakthroughs in the design and investigation of the intriguing light-matter interaction and charge transport phenomena in two-dimensional nanostructures and related devices are pushing up the efficiency of optical and electronic devices, such as lasers, detectors, flat optical devices, organic thin-film transistors and sensors. The Course will address the hot topics in the field of photonics, plasmonics and electronics with 2D nanosystems and related devices. The scientific program of the Course will cover the state-of-the-art on the following subjects: graphene and other 2D materials, nano-structured and functionalized surfaces, metamaterials, light-matter interaction at the nanoscale, nanophotonics and plasmonics, bio-electronics and bio-photonics, near field optics and scanning probe microscopy, terahertz nanophotonics and nanoelectronics, flat optics.

APPLICATIONS

Persons wishing to attend this Course should send a letter to the co-Director of the Course:

Professor Gaetano SCAMARCIO
Università degli Studi di Bari "Aldo Moro", Bari, Italy
Tel +39 329 3178716 – e-mail: *gaetano.scamarcio@uniba.it*

PLEASE NOTE

Participants must arrive in Erice on July 14, no later than 7 p.m.

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" FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE can be found on the WWW at the following address:
http://www.ccsem.infn.it

F. CAPASSO – G. SCAMARCIO – M.S. VITIELLO
DIRECTORS OF THE COURSE

G. BENEDEK
DIRECTOR OF THE SCHOOL

A. ZICHICHI
PRESIDENT EMFCSC