



«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 WATER AND WATER SYSTEMS

3rd Course: *ADVANCES IN FUNCTIONAL MATERIALS: FUNDAMENTALS, TECHNOLOGY AND SUSTAINABLE ENERGY PRODUCTION*

ERICE-SICILY: 6 – 8 JULY 2021

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

PROGRAMME AND LECTURERS

Halide perovskite photovoltaics

• A. ABATE, Università di Napoli Federico II, IT

In situ approaches to unveil structural dynamics in carbon-based electro catalysts

• R. ARRIGO, University of Salford, UK

Cluster formation and reversible aggregation in colloidal dispersions

• T.B.A.R. CASTANEDA-PRIEGO, University of Guanajuato, MX

Advanced carbon-based materials for electrochemical ammonia synthesis at ambient conditions

• S. CHEN, Dalian Institute of Chemical Physics, RPC

Effective metal-based semiconductor nanomaterials for solar photocatalytic hydrogen generation

• L. CLARIZIA, University of Naples Federico II, IT

Inspired by Biology: From Solvation of Macromolecules to Functional Materials

• V. CONTI NIBALI, University of Messina, IT

Molecular Dynamics approaches for the simulation of interfaces in functional materials

• A. DE NICOLA, Yamagata University, JP

Introduction to neutron scattering

• A. FARAONE, NIST, Gaithersburg, ma, US

In situ investigation of solid/aqueous and organic electrolyte interfaces for sustainable fuel production

• M. FAVARO, Institute Solar Fuels, Helmholtz-Zentrum, DE

New trends in molecular magnetism: design and applications at the nanoscale

• J.R. GALAN-MASCARÓS, ICIQ Tarragona/ICREA, ES

OLED Activities

• U. KIDO, Yamagata University, JP

Polymer brushes by grafting to reaction. Mechanism and applications

• M. LAUS, East Piemonte University, IT

How does water respond to hard and soft confinement?

• F. MARTELLI, IBM Research Laboratory, UK

Integrated photovoltaic-storage devices using new functional materials for sustainable energy production

• T. MERDZHANOVA, Forschungszentrum Jülich GmbH, DE

Design of functionalized colloidal particles for targeted self-assembled structures

• G. MUNAO, University of Messina, IT

Chitosan, nanocomposites as adsorbents for environmental remediation: challenges and opportunities

• M. SALZANO DE LUNA, University of Naples Federico II, IT

Molecular Mechanisms of Soft-Matter Rheology at the Mesoscale

• S. YIP, MIT-DMSE, Cambridge, MA, US

PURPOSE OF THE COURSE

The Course "Advances in Functional Materials: Fundamentals, Technology and Sustainable Energy Production" will include advanced scientific discussions and lectures on the theory, simulations and experiments devoted to understanding water based functional materials. The purpose of the Course consists in giving a balanced view of fundamental topics in the realm of functional materials (with a special care to fundamentals, technology sustainable energy production and processes). Modeling and applications of functional materials will be addressed, spanning from basic to advanced issues and covering physical, chemical and engineering aspects. Subjects of the lectures will include organic, inorganic and hybrid materials, with a focus on structural (3D, 2D, nanostructured and nano-confined systems, heterogeneous and amorphous systems, interfaces), dynamical (diffusion, relaxation, aging) and chemical aspects. The Course will cover a range of applications, including sustainable energy production, environmental remediation, smart systems, sensors and devices, enhanced mechanical properties. Lectures and specialized seminars will be given by leading experts and directed to graduate students, postdoctoral researchers and junior scientists working at universities and research institutions. The Course will provide room for critical discussion on issues that are currently attracting the attention of the researchers. By gathering participants with different specialized backgrounds the course also aims at cross-fertilization of ideas that could advance the state of the field.

APPLICATIONS

Person wishing to attend the Course should send a letter to:
Professor Francesco Mallalace: mallalace@unime.it

• PLEASE NOTE

Participants must arrive in Erice no later than 12 a.m. on 5h July 2021.

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 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 Comino, 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>